

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



VOL. 47, No. 3

MARCH 1979

FEATURED IN THIS ISSUE:

- ★ **SOLID STATE SWITCHES FOR VIDEO AND RF**
- ★ **LINEAR AMPLIFIER FOR THE IC202 AND IC 502**
- ★ **MODEL 15 TELETYPE INFORMATION**
- ★ **WIA AWARD UPDATES**
- ★ **RED COSS MURRAY RIVER CANOE MARATHON**

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COVER PHOTO

You can't start them too young. Tom Dexter, three-year-old son of Tony Dexter VK5DL, tunes 20 metres on the station receiver — a Hallicrafters SX100.

WIRELESS INSTITUTE OF AUSTRALIA

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Divisional information (all broadcasts are on Sundays unless otherwise stated):

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Secretary — Mr. W. L. Gellis VK4ABG
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SA:

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President — Mr. I. Nicholls VK7ZZ
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VK1 — P.O. Box 46, Canberra, 2600.
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VK3 — 412 Brunswick St., Fitzroy, 3066 (Ph. (03) 41 3535 Weekdays 10.00-15.00h).

VK4 — G.P.O. Box 638, Brisbane, 4001.

VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at West Thebarton Rd., Thebarton (Ph. (08) 254 7442).

VK6 — G.P.O. Box N1002, Perth, 6001.

VK7 — P.O. Box 1010, Launceston, 7250.

VK8 — (incl. with VK5), Darwin AR Club, P.O. Box 37317, Winnellie, N.T., 5789.

Slow Morse transmissions — most week-day evenings about 09.30Z onwards around 3550 kHz.

VK QSL BUREAU

The following is the official list of VK QSL Bureaus, all are inwards and outwards unless otherwise stated.

VK1 — QSL Officer, G.P.O. Box 1173, Canberra, A.C.T. 2601.

VK2 — QSL Bureau, C/- Hunter Branch, P.O. Terahla, N.S.W. 2284.

VK3 — Inwards QSL Bureau, Mr. E. Trebilcock, 340 Gillies Street, Thornbury, Vic. 3071.

VK4 — Outwards QSL Bureau, Mr. R. B. Prowse, 83 Brower Road, Bentleigh, Vic. 3204.

VK5 — QSL Officer, G.P.O. Box 638, Brisbane, Qld., 4001.

VK6 — QSL Bureau, Mr. Geo. Luxon VK5RX, 203 Belair Road, Crows Nest, S.A. 5082.

VK7 — QSL Bureau, Mr. J. Rumble VK8RU, G.P.O. Box F319, Perth, W.A. 6001.

VK8 — QSL Bureau, G.P.O. Box 371D, Hobart, Tas. 7501.

VK9 — QSL Bureau, C/- VK8HA, P.O. Box 1416, Darwin, N.T. 5794.

VK10 — Federal QSL Bureau, 23 Landale Street, Box Hill, Vic. 3188.

QSP —

THE ARNOLD REPORT

Well, here we are already three months into 1979, the year of the WARC.

Of course matters concerning this most important conference are uppermost in our minds at present.

And while this is naturally understandable, we must not forget the Institute and its wellbeing.

As you know, the prime object of the WIA is to look after the interests of its members, Australian Amateurs. It is funded by the members, and these members elect and are able to consult with, their governing council and its executive.

The annual meeting of the council, "The Federal Convention", is this year being held during April as provided for under the Constitution.

In 1976 Bob Arnold presented a report on the organisation of the WIA together with a number of suggestions.*

The Federal Council of the day, in deciding to retain the existing organisation, however did accept many of the suggestions that did not involve organisational changes.

Since the initial introduction of the Arnold Report, there have been changes in the climate of amateur radio in several areas.

It would therefore be well to give this report further thought, bearing in mind that we should attempt to make the most efficient use of our resources, both personnel and funds.

With the Federal Convention coming up, it is for the members of the Divisions themselves to provide guidance for their Federal Councillor in order that the Council may as a whole, after due consideration, reach decisions that will best serve the Institute.

I am looking forward to a Convention that will set the Institute well on the post-WARC road.

D. A. WARDLAW VK3ADW

Federal President.

* See AR for April 1976.

QSP

ULTIMATE DX

Remember the SETI article in AR for December 1978, page 55? Prof. Paul Horowitz W1HFA, writing in CQ for December 1978, describes a three month visit to the Arecibo antenna system in Puerto Rico. The dish is 1000 feet in diameter and it can steer 20° from the zenith in any direction. It has a gain of 68 dB at 1420 MHz and has an on-line computer to calculate the correct frequency every 20 milliseconds and set the local oscillator accordingly. This degree of accuracy is required because the earth's rotation causes the received frequency to drift at 0.15 Hz/second. The rubidium referenced oscillators are stable enough to allow multi-channel spectral analysis with a resolution of 0.01 Hz at 1420 MHz. Total bandwidth was 1 kHz resolved into bins of 0.015 Hz. The frequency most favoured was close to the neutral atomic hydrogen "hyperfine" spectral line at 1420.405751768 MHz. During three months in early 1978 Prof. Horowitz looked at all sun-like stars within 60 light years visible from the dish, a total of 185 stars. Sensitivity was 4×10^{17} watts/meter² which, if used in another star system, our galaxy with an identical twin using 0.5 mW CW, would have been easily detected at 1000 light years distance. Even using a choice from the 100 separate stages of receiver modules linked together as discrete "receiver units" produced no results.

PR IN EMERGENCIES

When a disaster or an emergency arises and a "net" is set up to handle traffic on the high frequencies, the word spreads quickly among the hams that that particular frequency is busy handling a public service from Amateur Radio. Rapidly the number of "listeners" grows. As a well trained Amateur, no stations other than those involved with the emergency situation will interrupt the proceedings. But this does not mean that hundreds, or perhaps thousands, might not be eavesdropping and discovering new areas that "they" can prepare themselves for in Amateur Radio work. And, just as our hams are listening, so is the SWL and "this" is the time we can do a job and promote public relations at the same time. Every operator working into that "Emergency Net" is a PR representative for Amateur Radio. — From San Diego ARNS Bulletin August 1978. ■

Meet the Professionals



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WIANEWS

John Payne VK3AED, Federal Councillor of the Victorian Division, accompanied by VK3 Council member Col Fisher VK3YII, attended the Executive meeting held on 25th January. Much of the time was devoted to discussions about the Channel 5A report submitted to Executive from the Victorian Division's special sub-committee.

It appears that lobbying in the political arena last year, coupled with other important factors relating to other frequency users of the Channel 5A spectrum allocation, has led to a re-appraisal of the use of this non-standard channel.

The Channel 5A report will now be considered by the VHFAC, under the chairmanship of Peter Wollenden VK3ZPA, to determine how best to prepare a suitable presentation for the attention of the Minister.

50 cm BAND

During the same meeting the opportunity was taken to hold a considerable discussion on the temporary allocation of the 50 cm band to the amateur service. This is a unique allocation with no counterpart elsewhere. It was made a temporary substitute for 70 cm after WARC 59, when the 70 cm band could not be allocated for amateur use because it was being used in Australia for other purposes. The 70 cm band was an amateur international allocation elsewhere in the world at that stage and, of course, still is to a greater or lesser degree in different regions.

Since, however, Government has not published any plans relating to UHF television and since the amateur service is very keen to foster UHF television in Australia to remove pressures in the VHF region, little is likely to be achieved by any action at

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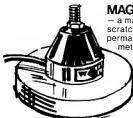
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this time. It is considered most important to secure the best possible allocation relating to the 6 metre band and the earliest possible removal of the Channel 5A allocation.

Those who have made a close study of frequency management concepts will understand the enormous number of problems to be resolved, with or without the influence of WARC 79.

1979 CALL BOOK

DO WE HAVE YOUR ACCURATE INFORMATION
FOR THE 1979 CALL BOOK?

Members can check the accuracy of the Call Book data by looking at their AR address labels. Any differences should be advised to Box 150, Toorak, as early as possible.

The real problem area is information about licensed non-members. Monthly lists of new calls, changes of address and cancellations used to come from the P. & T. Department even though delayed and containing inaccuracies. Now, however, there have not been any since April last year which makes it very difficult to produce a comprehensive Call Book. If any member would care to assist by asking non-members to send in their details to Box 150, Toorak, this would be greatly appreciated. We have over 2000 non-members listed on the computer file

but when the request for donations towards the costs of WARC 79 were mailed to them last October approximately 10 per cent were "returned to sender" by the Post Office as "left address", "unknown", etc.

WARC 79 APPEAL

Notwithstanding this setback, donations towards the expenses of WARC 79 have been coming in very satisfactorily. Over \$1500 has been donated in the last few months and a listing of donations from members will be published as soon as space in AR permits.

MEETINGS

The Executive Meeting on 25th January also discussed the Ron Wilkinson Achievement Award, WICEN training exercise requirements, the appointment of Bill Verrill VK5WV as the new Federal Awards Manager, and thanks to Brian Austin VK5CA, presently hospitalised, for his work in this area. Ideas about the proper use of the \$3500 donations for Federal Education and a number of other items.

PROJECT ASERT

A meeting of Project Asert on 18th January reviewed the latest situation for a report in AR and proposed standards for receiving equipment.

THE RON WILKINSON ACHIEVEMENT AWARD FOR 1978

Details of this estimable annual Award were set out on page 17 of AR for March 1978. The Award is funded from interest received from a most generous donation received from Mrs. Mary Wilkinson, widow of the late Ron Wilkinson VK3AKC.

For the year 1978 two names were considered by Executive and after considerable thought, both were recommended to receive the Award jointly.

The President of the Tasmanian Division, Ian Nichols VK7ZZ, submitted and recommended the name of Winston Nichols VK7EM, of Penguin. His recommendation received the support of the Tasmanian Division Council.

VK7EM receives the Award for his outstanding work over many years for VHF and Amateur Television signals on 70 cm. He still holds a distance record for a successful two-way ATV contact on 70 cm with VK3 and hopes to extend this by

contacting a VK5 as early as possible.

The other recipient is well known to almost every Australian amateur for his persistent and continuous work over many years in the field of Intruder Watching. He is none other than Alf Chandler VK3LC. Alf's devotion to his task, despite every conceivable difficulty, has ensured the continuance of this most important activity. Without him there might have been no Intruder Watch service.

His overseas contacts and close liaison with IARUMS ensures that Australia is represented in the international area. He is also the Intruder Watch Co-ordinator for IARU Region 3. If he could not obtain satisfaction through the local channels for reports, he certainly obtained several successes through the good offices of his friends abroad.

Congratulations to VK7EM and VK3LC for their well-deserved recognition.

WANTED

Qualified accountant with amateur call sign to advise the Federal body on financial matters in particular. Work load is barest minimum, no book-keeping. One meeting each month on the average and possibly only an hour or two extra to study accounts. Would suit any qualified volunteer in Melbourne area wishing to donate a few hours of his time to the WIA.

Please ring Executive office 24 8652.

A SHORT COURSE IN PUBLIC RELATIONS

- The 6 most important words:
"I admit I made a mistake".
- The 5 most important words:
"You did a good job".
- The 4 most important words:
"What is your opinion".
- The 3 most important words:
"If you please".
- The 2 most important words:
"Thank you".
- The least important word:
"I".

QSP

144 MHz BAND TE OPENINGS

On 5th November last beacon station Z66DN on 144.13 MHz was received in Athens by SV1DH, a distance of about 7100 km.—IARU R1 News January 1979.

10m BAND INTERNATIONAL BEACONS

According to IARU R1 News of January 1979 the following is a list of 10m band beacons —

MHz	Station	Location
28.175	VE3TEN	Ottawa
	Change to new frequency delayed.	
28.205	DL0IGI	W. Germany
28.2075	N4RD	Fla., USA
28.210	3B8MS	Mauritius
28.2125	ZD9GI	Gough Is.
	Under construction.	
28.215	GB3SX	Gowborough
28.220	584CY	Limassol
28.2225	HG5AIR	Budapest
28.23	ZL2MHF	Mt. Clinton, NZ
28.235	VP9BA	Bermuda
28.245	ASXC	Bahrain

THE BARGAIN KINGS

From Florida Skip (W4IYT) from the Phantom XYL. The wife of a Ham can never brag.

About the bargains she does snag. While the wife of a man who, with his face straight

Can say, "I got everything for eight-ninety-eight".

It seems his gear all comes from MARS.

Or he salvaged it out of railroad cars.

And he got some of it at a surplus store.

Where he always discovers bargains galore.

(He gets it all in the 50c bin — and he

Filled his whole sack for less than a fix.)

At the CAREN club auctions he got parts for a

steal

He got tubes and translators for a price that's

unequal

For two bucks he got 5,000 pounds of neat junk

That all went with us in our automobile trunk

And I've not even touched on the trading he's

done.

Many's the time he got three for one.

And the treasures he's given that someone can't

use

Like the receiver he found that just needed a

fuse.

And the telephone treasures that he holds so dear

Were traded by friends who stopped by for a

beer.

No ham ever tells his wife or his honey

That something he has actually costs money.

I wonder who supports Heath and Crabtree

The inescapable conclusion — it must be CB.

—From San Diego ARNS Bulletin August 1978.

SOLID STATE SWITCHES FOR VIDEO AND RF

Andrew Pierson
1 Bindana Ave., Salisbury Park 5109

For switching low level RF and video signals (in the order of 1V p-p), a fully electronic switch will do the job much faster and more reliably than a relay. The cost will be about the same or less than a medium quality standard relay, depending on the type chosen. There are other additional advantages: better cross-channel isolation, impedance buffering between input and output lines and also a low current control line.

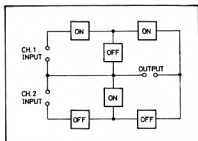


FIG. 1(a)
Channel 1 selected

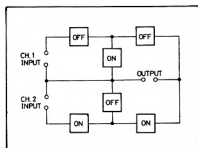


FIG. 2(b)
Channel 2 selected

The input impedance for each channel of the Type 1 (IC) switch is about 900 ohms, and about 9k ohms for the Type 2 (discrete) switch. Depending on the circuitry feeding the switches, it may be necessary to terminate the inputs with a resistive load, in order to correctly match the characteristics impedance of their respective coaxial cables. In this respect, the switches presented have the advantage over a relay that a very low output impedance is achieved without imposing any significant loading on the input line. Therefore, the input may be arranged to perform a "bridging" function, if necessary.

The outputs from the switches may be terminated or not, according to your requirements. Remember that coaxial cable is a transmission line, and that long lengths should be terminated in their characteristic impedance, in order to prevent mis-matching and consequent reflections.

Both switches are designed to operate from a +12V supply rail, and consume between 25 and 45 mA of current, depending on the type used and also which channel is selected. The control voltage states are 0V for channel 1 out, and +12V for channel 2 out. The "low" state should be less than +0.5V, and the "high" state should be greater than +11V. The control line resistance is about 30k ohms in the case of the Type 1 switch, and about half that value for the Type 2.

CIRCUIT DESCRIPTION — TYPE 1

Heart of this switch is the 4016 integrated circuit, which contains four separate CMOS bilateral switches. These may be considered as "electronic relays", but they have an "on" resistance of a few hundred ohms. Hence, if we are going to use them in a low impedance switching application, some form of current driver will be required after the switch. Also, if they are wired for a simple SPST function, the stray shunt capacity existing across each switch in its "off" state will give rise to crosstalk at high frequencies from the channel which is supposed to be switched off. This shortcoming is remedied by using six switches (three for each channel), wired in the configuration shown in Figs. 1(a) and 1(b).

In this manner, signal passed via the "carry-through" capacitance of the first series switch in each channel is shorted to ground when that channel is "off". The two series switches prevent the shunt switch from shorting either the input or the output lines.

DC operating bias for the output emitter follower is provided by a resistive divider network at the input of each channel. When the system changes over, bias is supplied from that network associated with whichever channel is selected. The AC input signals are capacitively coupled on to this fixed bias voltage, and thus either signal can appear (together with the bias) at the output of the switch, which is then applied to the base of an emitter follower.

The output line is capacitively coupled from the emitter of this stage. The bias level at this point is about +1.65V DC, which implies an output drive amplitude capability for a symmetrical signal of 3.30V p-p (unterminated) or 1.65V p-p (terminated in 75 ohms). Note that the broad-band gain of the switch does not alter significantly when it is terminated; the drive capability drops to half its value, i.e. you can only apply a maximum of 1.65V p-p to the inputs. This is more than adequate for a standard CCIR TV signal (1V p-p). The 10k ohm resistor across the output line prevents the build-up of a DC potential due to the leakage resistance of the 1000 uF electrolytic coupling capacitor when the switch is running unterminated.

PERFORMANCE — TYPE 1

The broad-band insertion loss of this switch is 0.36 dB (unterminated) and 0.73 dB (terminated — 75 ohms). The response (referred to 1 MHz) at 30 MHz is —1.6 dB (unterminated) and —5.3 dB (terminated — 75 ohms). The crosstalk (measured at 5 MHz) is better than 60 dB down, but note that these figures can be spoiled by poor circuit layout. These and other parameters

The need to switch high frequency, low level signals at coaxial line impedance often arises, particularly when TV video signals are being handled. Whilst a commercial toggle switch will often suffice, it is not capable of being remotely actuated. Also, since these devices are not intended for switching RF, radiation and crosstalk problems (in a changeover application) may ensue. A standard relay will enable remote operation, but these two problems may still be present. The ideal answer is to use a good quality coaxial relay, but of course these devices are not cheap. If you have the need to switch high level RF signals, the coaxial relay is probably the best choice, especially if transmission line impedance discontinuities are to be avoided.

Two designs for solid state video switches are presented. The first (Type 1) employs a pair of 4016 CMOS quad bilateral switches, and the other (Type 2) uses all-discrete circuitry. The capabilities of both configurations are broadly similar, with the IC design having generally superior performance for most parameters. Of course, the discrete design may do all that you require at a lower cost. The following comments apply equally to both circuits, after which the operation of each type will be discussed separately.

Both switches are intended to perform a changeover function for standard CCIR TV video waveforms, which have an amplitude of 1.0V p-p. The circuits are designed to drive 75 ohm coaxial cable, although they would drive 50 ohms lines with a small deterioration in signal handling capabilities and high frequency performance. The input and output lines of both switches are AC coupled, with the time constants being such that no frame tilt is detectable on a transmitted CCIR TV waveform. This good low frequency characteristic (together with the HF response figure) makes the switch circuits more than adequate for very high quality audio signals, if you have a requirement in this direction. If a low output impedance is not required, the emitter follower stage may be omitted in both designs. This will greatly reduce current consumption and also lower the total cost.

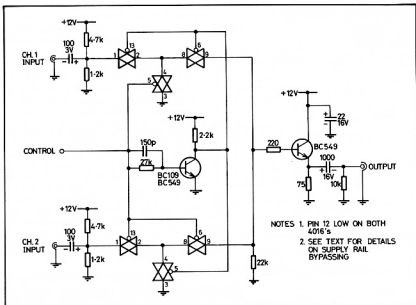


FIG. 2: Solid State Video Switch, Type 1

may be compared with those of the Type 2 switch in Table 1.

CIRCUIT DESCRIPTION — TYPE 2

This switch operates on an entirely different principle to that employed in Type 1. Here, the configuration consists of two common-emitter amplifier stages sharing the same collector load resistor. Each stage is provided with operating bias upon which the signal to be switched is superimposed. Now, each emitter load is returned to earth via the collector-emitter junction of a switching transistor. The control signal is applied to the base of the switching transistor associated with channel 2, but the switching transistor for channel 1 is supplied with an inverted version of the control signal. Thus, only one channel can be activated at any particular time. Since the bias networks for each channel are identical, the DC conditions of the switch remain unchanged whilst the AC information changes over from channel 1 to channel 2 when the control line is taken to +12V.

Since a phase inversion is incurred in this switching process, a unity-gain inverting stage follows, in order to restore the correct signal phase. The final stage is an emitter follower which provides a low impedance drive to a coaxial line. The purpose of the 10k ohm load across the output has been described in connection with the Type 1 switch. The bias voltage at the emitter of the cable driver stage is typically 2.0V, which gives a maximum symmetrical signal drive capability of 4V p-p (output unterminated) or 2V p-p (output terminated — 75 ohms).

PERFORMANCE — TYPE 2

Note that in the common-collector pair the ratio of collector load to emitter load re-

sistance is slightly greater than unity (1.19). This small gain figure conveniently makes up for other losses incurred in the circuit. As a result of this, the overall broad-band gain for the Type 2 switch is 0.67 dB (output line terminated) and 0.18 dB (output line terminated — 75 ohms).

Since excess current gain is available, frequency compensation is employed in the phase inverting stage by means of C_c , which lifts the gain at high frequencies as its capacitance reactance falls. For normal video bandwidths (5-6 MHz) the inclusion of this component is unnecessary. However, if the optimum bandwidth is required, the value of C_c should be 47 pF if the output stage is to run un-terminated. The —6 dB bandwidth under

these conditions will be approximately 22 MHz. If the output is to be terminated in 75 ohms, C_c should be made 56 pF. Then the —6 dB bandwidth will be about 19 MHz. Note that the above compensation capacitor values are for optimum square wave response, i.e. the frequency vs. amplitude characteristic does not exhibit a positive slope at any point. The cross-talk figure (—32 dB at 5 MHz) is not as impressive as that for the Type 1 switch but it is quite adequate for normal video use.

CONSTRUCTIONAL DETAILS — TYPES 1 AND 2

For the Type 1 circuit, PC card would prove the most suitable method of construction, due to the presence of two ICs. A piece of either DIL experimental card or VEROBOARD would be the most expedient. The Type 2 switch circuitry is more amenable to hard wiring techniques, but a specially laid out PC pattern with plenty of earth area would be the ideal method for both designs.

All resistors may be ¼ watt 5% tolerance, and all electrolytics are "tag" tantalums, with the exception of the 1000 uF output coupling capacitors which are etched aluminium foil types. All the 150 pF "speed-up" capacitors may be ceramics, and the frequency compensation capacitor in the Type 2 switch may be a silvered mica or NPO ceramic type. The BC109 transistors have been used because of their high current gain, and substitutes with minimum current gains of less than 200 should not be used. Similarly, the 2N3638A in the Type 2 circuit has been chosen for its current gain, and should not be replaced with a 2N3638.

Although the dissipations of the output emitter followers are within the 300 mW limit for the BC109 (228 mW and 267 mW for Types 1 and 2 respectively), BC549s have been specified for these positions as their higher dissipation rating (500 mW) should ensure better long-term reliability.

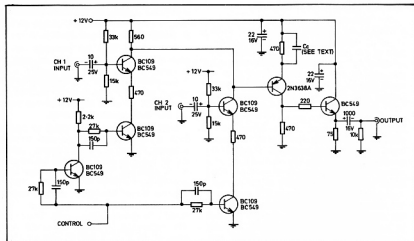


FIG. 3: Solid State Video Switch, Type 2

Even so, the output drivers run at a fairly high temperature, and arrangements for adequate convection cooling should be made.

In connection with bypassing, it should be noted that the supply rails to both 4016s in the Type 1 switch should be bypassed at the chip by means of 22 μ F, 16V "tag" electrolytics. Also, the 220 ohm series base resistor and the 22 μ F, 16V "tag" bypass at the collector of the output emitter follower stages are important anti-oscillation measures, and should not be omitted. The bypass capacitor should be situated as close to the collector as possible.

If you intend to put either of these switches to use in applications where their extended low frequency response is not

required (e.g. for switching over a pair of HF VFOs), it would be prudent to replace the input and output electrolytic coupling capacitors with smaller value ceramics. As well as saving both space and money, you will circumvent any possible problems which may arise at HF due to inductive effects within the output coupling capacitor.

On a final note, it may have occurred to some readers that one of the unused 4016 sections in the Type 1 switch could have been used as the control line inverter. The reason why I did not do this is that I preferred to keep the control and switching functions apart as far as possible, in order to avoid interaction effects when the circuit is handling signals near its upper frequency limit, i.e. about

30 MHz. However, if you would like to try this method, it is performed in the following manner. Ground the output of the 4016 section, and connect the input to the +12V rail via a 2.2k ohm resistor. Connect the control pin for this section to the master control line, and then an inverted version of the control signal will appear at the input. The low point of this swing will be higher than that from the BC109 inverter stage due to the "on" resistance of the 4016, but it will adequately switch the other 4016 sections. Under these conditions, the master control line resistance will be very high (all CMOS), which may prove advantageous to you. Also, the current drawn from the +12V rail will remain at 25 mA irrespective of the channel selected. ■

PARAMETER		TYPE 1	TYPE 2	UNITS
SUPPLY VOLTAGE		+12	+12	V
SUPPLY CURRENT	Channel 1 selected	25	40	mA
	Channel 2 selected	30	45	
CONTROL LINE LOGIC LEVELS	To select channel 1	Between 0 and +0.5	Between 0 and +0.5	V
	To select channel 2	Between +11.0 and +12.0	Between +11.0 and +12.0	
CONTROL LINE CURRENT	0V (channel 1 selected)	0	0	μ A
	+12V (channel 2 selected)	420	840	
INPUT IMPEDANCE	Channel 1	0.87 (min.)	9.3 (min.)	k ohm
	Channel 2	0.87 (min.)	9.3 (min.)	
OUTPUT IMPEDANCE		To drive 75 ohm or 50 ohm (see text)	To drive 75 ohm or 50 ohm (see text)	ohm
MAXIMUM OUTPUT VOLTAGE SWING (for a symmetrical input waveform)	Output unterminated	3.30	4.0	V p-p
	Output terminated — 75 ohm	1.65	2.0	
BROAD-BAND INSERTION LOSS OR GAIN (measured at 1 MHz)	Output unterminated	—0.73	+0.67	dB
	Output terminated — 75 ohm	—0.73	+0.18	
HF RESPONSE (relative to 1 MHz)	Output unterminated	—1.6 dB at 30 MHz	—6 dB at 22.4 MHz (Cc = 47 pF)	db - MHz
	Output terminated — 75 ohm	—5.3 dB at 30 MHz	—6 dB at 19.25 MHz (Cc = 56 pF)	
CROSSTALK				
CONDITIONS: (1) Measured at 5 MHz. (2) 1V p-p input to Ch. 1. (3) Ch. 2 input shorted.		(4) Ch. 2 selected. (5) Output terminated. (6) Output measured with respect to Ch. 1 input.		
		—60	—32	dB
ALTERNATE CHANNEL OUTPUT OFFSET VOLTAGE (measured at 100 kHz)		50 (typ.)	100 (typ.)	mV
SWITCHING TIME				
CONDITIONS: (1) Measured at 100 kHz. (2) Control voltage swing 0V-10V.		(3) Result is time taken for a 10%-90% change in offset voltage.		
		0.5	2.0	us

30 Moore St., Box Hill South, 3125

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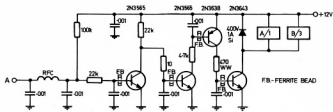


FIG. 2: PTT Relay Driver to suit IC502 or IC202

ductor's inner conductor during the receive condition and zero on transmit.* This is part of the send-receive diode antenna switching control system. This voltage is used in the scheme shown in Fig. 4 to control the linear amplifier via the relay driver shown in Fig. 2.

An alternative is to connect the microphone to the IC202 (or IC502) via the amplifier and so access the PTT line. This is a simple scheme but to avoid upsetting the PTT circuitry in the transceiver the same relay driver should be used. See Figs. 2 and 3.

The author used coaxial relays for antenna change-over but any low RF loss switching relay can be used. Remember, especially on two metres, to take care here as losses will reduce receiver sensitivity. You can't work the DX if you can't hear it!

On two metres a low noise preamplifier is a worthwhile inclusion as the IC202 noise figure whilst adequate is not the lowest available. If a preamplifier is used "bare-foot" operation becomes inconvenient without more switching. On six metres the IC502 would suffer severe cross-modulation in channel 0 areas if a receive preamplifier were used.

The prototypes of both amplifiers were built using printed circuit laminate soldered together to form a combined box and chassis. This is an easy method of construction and provides readily solderable earth planes. Earth leads can be kept very short and shielding is easy, important factors in maintaining stability. The board used was the cheap surplus "moulded mud" variety as the dielectric properties are unimportant.

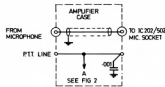


FIGURE 3: Using the PTT Line Actuation

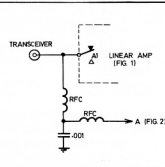


FIGURE 4: Using the Coaxial Line Actuation

*The IC502 requires a modification to short out a DC blocking capacitor in series with the antenna connector. — Tech. Ed.)

FOX HUNTING – MANUAL GAIN CONTROL FOR THE IC202

Gil Sones VK3AUI
30 Moore St., Box Hill South, 3128

Foxhunts require a manual gain control to reduce receiver sensitivity as the hidden transmitter is approached. The IC202 is a very compact rig and can, if necessary, be carried overland (or water if on some foxhunts . . . Ed.).

This very compactness makes the provision of a manual gain control a problem. Many owners are not prepared to drill holes in the case anyway. Salvation is at hand because the PTT line, available at the microphone socket, is connected to the control transistors supplying the major gain stages of the receiver. All that is required is a potentiometer connected between the PTT line and ground.

The manual gain control may be mounted as a plug-in module or built into the microphone case.

The circuit is shown in Fig. 1. The nominal 150 ohm resistor R1 should be

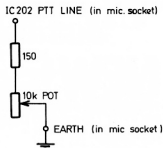
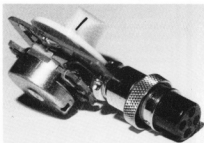


FIG. 1:

Photos of Manual Gain Control



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Based on the powerful F-8 microprocessor system, this new product from Info-Tech, advanced technology is as addition to the popular Model 100.

\$668

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CLOCK/WATTMETER/SWR BRIDGE

ELECTRONIC CLOCK has 5 h, red LED digits, AM-PM light, flashing seconds colon, and 12 hour format. Peak-reading WATTMETER has 3 ranges—0-20, 0-200, 0-2000 watts. SWR BRIDGE shows standing wave ratios of 1.5, 2, and 3 from 3 to 2000 watts. Operates on 24V AC. Great base station accessory for Hams.

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The most deluxe Black Cat accessory. MONITOR SCOPE permits measuring RF output to antenna and viewing modulation patterns. FREQUENCY COUNTER has six big LED digits. 1 to 50 MHz range (typical), 100 cycle readability, 50m V sensitivity. Peak-reading WATTMETER has 3 scales—0-20, 0-200, 0-2000 watts. SWR BRIDGE shows standing wave ratios of 1.5, 2, and 3. Perfect for Ham base stations. JB1003SCM.

\$379

MULTI PALM II 2M/FM POCKET TRANSCIVER

SPECIFICATIONS

Transceive frequency range 2 MHz in 164.168 MHz transceive channels 6, channels antenna impedance 50 ohms unbalanced, BNC connector power requirement 32V DC (negative grounded). Power consumption transmit 300 mA, receive 100 mA standby 25 mA. Size 68 mm (2.43/54 in.) wide, 154 mm (6.1/16 in.) high, 41.5 mm (1.43/54 in.) deep, 470g (1.03 lbs.). Repeater offset +800 kHz modulation variable reaction phase modulation, max deviation +5 kHz microphone confenser, microphone receiver, double conversion superheterodyne (1st IF: 16.9 MHz; 2nd IF: 455 kHz). Sensitivity—4 dBu NQ (20dB). Audio output maximum 0.3 watts. Attachment rubber duckie antenna, Nicad battery pack, DC cable with cigarette lighter plug. Carrying strap.

\$229

INFO-TECH M-300 TRI-MODE KEYBOARD



A microprocessor controlled keyboard that generates Morse, RTTY and ASCLL. Write or call for further specifications.

\$564

FDK BIGEAR TRANSCIVER Type2



2m FM PLL SYNTHESIZED MOBILE TRANSCIVER

● 144-148 MHz PLL digital synthesizer system (800 channels) ● A large-sized LED, digital display system provides readings up to six figures ● Easy-operating separate and selective mechanism displayed by the frequency unit for band operation ● Transmitting output: 25W/1W, two-step selector switch ● Provides repeater operation of ± 650 kHz and desired frequency ● HF output with S meter indicator.

\$375

MODEL HF3-100L



2 DUAL POWER BI-LINEARIZED HF AMPLIFIER

● Full 80-10m broadband coverage ● Full 300 watts output AM (150-200 watts PEP on SSB) ● Dual power: Selectables 5/10 watt input power ● Operating modes: AM, FM, CW, SSB, RTTY, SSB ● Broadband—requires no tuning across band ● Harmonic levels typically—30 dB or better (see specifications) ● RF actuated switching relays ● Full VSWR and reverse voltage protection ● Extra stabilization circuitry ensures spurious-free operation at all input, power levels ● Under 0.8 insertion loss in receive or bypass mode ● Remote control capability ● Receive pre-amp nominal 18 dB gain across band.

\$225

VHF MODELS 2M 10-80P

● 10W input, 80W output nom ● Low power input yields nom 10 dB gain ● Covers entire amateur band w/o tuning ● Receive pre-amplifier ● Automatic TR switching or hard keying ● Variable TR delay for SSB/CW use ● Pre-amp and power amp is independently controllable ● Pre-amp nom 11 dB gain, 24v db overall RF.

\$249

alda 103



3 1/4" H x 9" W x 12 1/2" D
totally solid state
SSB Transceiver

80 through 20 metres
250 WATTS
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ROBOT SCAN CONVERTOR MODEL 400



● All solid state random access memory ● Slow-to-fast and fast-to-slow conversion capability ● SSTV picture display on any standard CCTV monitor ● Frame freeze from any standard CCTV camera, broadcast video or video, tape source ● Permanent picture storage ● Automatic or manual TV frame switch ● Internal grey scale generator adjustable standard ● Capable of real time display of digitally processed fast scan video.

\$898

FDK BIGEAR TRANSCIVER TYPE 1



2m FM SSB CW PLL SYNTHESIZED MOBILE BASE TRANSCIVER

● 144-148 MHz PLL digital synthesizer system, 800 channels (5 kHz step), 5500 channels (10 kHz step), plus VFO system (± 7 MHz) ● AC 117/240V, DC 13.8V, two-step power supply ● Digital display system (using a large-sized LED), providing reading up to six figures ● Transmitting output: 10W/1W, switching mechanism ● Front loud-speaker suited for base station ● Easy-reading, separate S/R/F center meter ● ON AIR/RECEIVE/RTT position displayed by LED ● Include RTT, AGC, VOX and noise blaster circuit ● Provides repeater operation of ± 600 kHz and ± 1 MHz.

\$694

ATLAS 215X-HF Transceiver \$795

FT101E: AC-DC **\$839**

Wilson SY-2

NATIONAL	RJX-1011 Transceiver	\$1,990
	RJX-S1011 Speaker Unit	POA
	RJX-V1011 VFO Unit	\$950
	RJX-F1000/DRAS Receiver	\$468

YAESU	FT101E Transceiver	\$839
	FT101 Transceiver	\$840
	FT101D Transceiver	\$950
	PP-301 AC Power Supply	\$175
	RG-7 Receiver	\$339
	FTV-650 Gen Transceiver	\$249
	FTV-301 External VFO	\$139
	RG-7000	\$639

LUNAR	HC-300/2 Linear Amplifier	\$235
	BI-LINEAR VHF Models	\$209
	28-432 MHz Low Noise Pre-amplifier	\$42
	PGCAB-01, UHF Pre-amp Converter	\$36
	PAI-SSB VHF In-line Pre-amp, Low Noise (5m)	\$54
	PA-14B VHF In-line Pre-amp, Low Noise (2m)	\$54
	PA-28 VHF In-line Pre-amp, Low Noise (10m)	\$54

FDK PRODUCTS	Type-1 2m/ SSB CW PLL Mobile/Base	\$694
	Type-2 2m/FM PLL Mobile Transceiver	\$375
	Multi-amp 2m/2m/FM 6 ch. Pocket Transceiver	\$209
	Multi-800 2m/FM PLL 800 ch. Mobile	\$416
	Multi-2700 2m/FM SSB CW AM Base	\$704
	Leather case (for Multi-amp 2)	\$11.50
	Battery charger (Multi-amp 2)	\$1
	Crystalline (for Multi-amp 2)	\$3

WAWASEE PRODUCTS	JB1002FC/M Counter/Wattmeter	\$225
	JB1003C/M Clock/Wattmeter/SWR	\$135
	JB1003C/M Scope/Wattmeter/SWR	\$379
	JB1003SW Scope/Wattmeter/SWR Bridge	\$175
	JB1003SW Scope/Wattmeter/SWR Bridge	\$330

B & W PRODUCTS	Model 333 Dummy Load Wattmeter	\$122
	Model 334 Dummy Load Wattmeter	\$221
	Model 335 Dummy Load Wattmeter	\$255
	KENWOOD PRODUCTS	POA

ANTENNAS	SV-1 4-el. on 20, 15 & 5-el. on 10m	\$300
	SV-2 3-el. on 20, 15 & 3m	\$240
	4-BT V, w/8m Resonator (10-40m vertical)	\$135

ELECTROCOM	"Series 400" Shift Converter	\$990
INFO-TECH	Model 175 RTTY to Video Converter	\$448
	Model 175 RTTY Keyboard	\$407
	M-200E Morse, RTTY & ASCII to Video Converter	\$668
	M-300E Morse, RTTY & ASCII Keyboard	\$564

ROBOT	Scan Converter	\$898
	12 in. Video Monitor AVM-095	\$169
	AV-80 Video Camera	\$270

NIZUHO	SK-55 RF Pre-amplifier	\$86
	SK-1 Pre-selector	\$63
	SK-550 Counter Generator w/Prescaler	\$220
	KK-1 Coupler	\$50
	NX-1D Marker	\$69

OSKERBLOCK	SWR-200 Power Meter	\$111
	SWR-200B Power Meter	\$84
	Couplers 6m and 2m	\$30
	Couplers 0.7m	\$39

ROTATORS	Commander F4000 Rotator	\$117
	Rotator Power Supply	\$22
	Alow 3000 Rotator	\$220
	6-core Rotator Cable	\$1,00m
	Must Clamps	\$11 (set x 2)
	Coaxial Cable RG 8/U Low Loss	\$3.30m

Wilson SY-2	Delivers outstanding performance on 20, 15 and 10 metres. Features Wilson's large diameter High-Q Traps, feeding with 52 ohms coax, a beta match method presents tapered impedance which provides most efficient 3 band matching and DC ground to eliminate precipitation static. The result is SWR less than 1.5 to all bands and maximum front-to-back. An added feature is the separate 10 metre reflector for correct moonband spacing. Add to this the rugged boom to element mounting, heavy duty taper swaged elements.	\$240
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SOME INFORMATION ON THE MODEL 15 TELETYPE

G. F. Hughes VK2ZNY
P.O. Box 37, Ryde, 2112

In the short period that has elapsed since RTTY groups have been established, the availability of machines has been on the increase, particularly in two major brands. This article deals with one of them.

The Model 15 Teletype (and its various offshoots equipped with paper punchers and readers) is an old and reliable model. Although it suffers from antiquity, it is nonetheless a very easy machine to set up.

In the following paragraphs are some bits and pieces which the author hopes will help those who have recently acquired one of these machines.

CIRCUITS

These are divided into three groups: the baseplate which is primarily the motor and its speed regulator, the transmitter, and the typehead (receiver). If your machine is intact, your circuits will be as shown in the diagrams. It must be noted, however, that some Model 15 machines could be ex-PMG, and certain facilities not required by the Department may be omitted.

The motor speed regulator is a centrifugal type fitted at the rear end of the motor in a drum. Contacts and RF chokes are included in this unit. A rear plate carries a double brush contact arrangement to carry power to this section. Speed is checked by observing strobe marks painted on the periphery of the rotating member. The use of ordinary 50 Hz lighting for this is not, strictly speaking, applicable as the shaft revolves at 2308.5 r.p.m. for 50 Baud rate, or 2098.5 r.p.m. for 45.45. If one is prepared to paint 3 equally spaced marks around the drum periphery, the motor speed will have a 3.4 per cent error at 45.45 Bauds using a 50 Hz lamp (for a stationary pattern, exactly 46.995 Bauds is the setting).

The transmitter consists of a cam unit operating 6 sets of parallel connected contacts, and is provided with the necessary network for operating on DC lines. For AFSK, this network may cause problems and should be disconnected if operation directly from these contacts is anticipated. A contact "debouncing" circuit should also be considered. When series connecting the transmitter and typehead to produce local copy this network may be needed. It is a good idea to run the transmitter contacts into the AFSK modulator, and obtain local copy by demodulation. In this way a constant check on the MODEM (modulator-demodulator) system can be had while

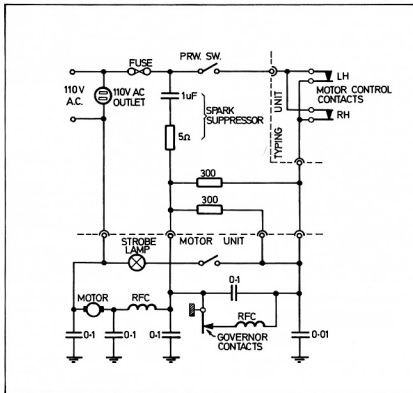


FIG. 1: Model 15 Teletype System

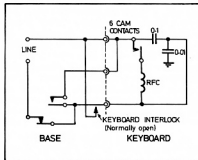


FIG. 2: Transmitter

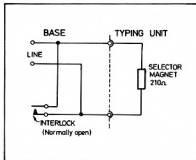


FIG. 3: Receiver

transmitting or punching a tape; while playing a tape or receiving, the demodulator only is used.

The typehead consists of a pair of coils whose total resistance is about 210 ohms, and requires 60 mA for proper operation. When connected as the receiver on a long telegraph line, it is usually preceded by a correction network to correct for line waveform distortion of the ideal square form. For amateur use, the coils are driven directly. Low impedance drive tends to be rather sluggish when operating in the constant voltage modes.

Ideally, the typehead magnet should be driven from a high voltage source via a high resistance. At the lowest possible voltage, the time constant will be L/R , where $R = 210$ ohms, and L is the coil inductance (a constant). If the supply voltage is, say, 150 volts (current 60 mA), the series resistance would be 2500 ohms. When substituted into the above formula, it is easy to see that the apparent magnet speed will be about 12 times faster. We can also make the release time just as fast by quenching the back EMF via the same resistor through a catching diode across this series combination — not just across the coil. This would be required to protect a keyer transistor from reverse Vce breakdown in any case. Dissipation of the resistor is about 9 watts, and can be handled either by a single 10 watt unit or ten 250 ohm 1/2 watt units in series.

POWER SUPPLY

As the motor of the machine operates from 110V AC, a suitable stepdown transformer must be used. This can, with a bridge rectifier and capacitor of 100 uF or so also provide 150V DC nominal voltage for the typehead magnet/resistor circuit by grounding one side. Although it leaves the motor circuit "up in the air" when con-

nected to the same transformer secondary, there shouldn't be too many problems of hash experienced with suitably filtering around the motor governor circuit. The author used an old TV power transformer normally used in a voltage doubling HT supply, furnishing 105V RMS and 6.3V heater. Under load, the motor was quite happy with the slight voltage difference. The heater winding was operated with a voltage doubler and gave sufficient input to drive a 12V three terminal regulator to supply the Modem.

SOME THINGS TO TRY

Remembering Department "mods", certain facilities may or may not be included on your machine.

Motor Stop: If the letter "H" or "J" in the FIGS selection immediately follows the blank (without space), the motor will stop. The typehead magnet must be de-energised to allow various levers to close the series motor control contacts to start the motor. The contacts are located on the lower front portion of the typehead basket assembly. If you want to disable this section, go to it!

Signal Bell: It is wise to retain this facility, as it can be used at the commencement of a transmission. It is designated on the typing keys in FIGS as a bell symbol or the letters "BL". In telegraph hookup, it is used to set other teleprinters into operation that may be in standby mode, and to wake up the sleeping operators (as if they couldn't hear a Model 15 making its noise!). It is also handy to make sure that the machine is operating properly, thereby eliminating the risk of printing garbage.

Keyboard Lockout: If two blank signals are received consecutively without any other character or spacing breaking the

sequence, a handle marked "SEND-RECEIVE" will move to receive position. This closes a pair of contacts which short out the keyboard transmitter bank. The handle must be manually moved to SEND to transmit from the keyboard.

ADJUSTMENTS

To optimise the machine for receiving, it is important that the decoding cam in the typing system is in step with the transmitter of a second machine. The letters "RY" are used in continuous fashion while adjusting a quadrant lever at the LH side of the machine. Unlock and move this lever while noting the scale position where the machine prints garbage. Move the other way for the same effect and set midway between the two. This assumes that the motor speed is set to amateur Baud rate of 45.45.

The motor speed is set by adjusting the spring tension pulling against a centrifugal weight fixed to a pair of contacts inside the drum fitted to the rear shaft section of the motor. Two levers skim a rubber tyre wheel fitted to an adjustment screw in the drum, and either increases or decreases tension appropriately. With a little inspection, these levers are easy to find. One is situated between the drum and the rear cover of the motor on top of the bearing, while the other is fixed to a large spring at the back. This system may appear archaic, but it is the basis of the XYL's Sunbeam Mixmaster food mixer, or the motor governor in the majority of cheap type (and some exotic) cassette recorders!

There may be other characteristics not listed here, and the author apologises for any missed. How about sending in your pet RTTY gimmick for all to share?

73s. Goodnight.

COMMERCIAL KINKS

RON FISHER
VK3OM

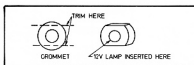


FIGURE 1

This month we return to the Yaesu FRG-7 receiver. Arthur Solomon VK3LJ has come up with some simple tricks which no doubt increase the pleasure of using this fine receiver.

Over to Arthur.

"Recently I purchased an FRG7 and am delighted in general with it. After experiencing the many shortcomings of other receivers in the moderate price range, I consider the acquisition of the FRG7 a definite step forward.

Nevertheless, I do have some criticisms (rather obvious ones, perhaps) and some simple modifications which may be of interest to you and to your readers in AR. I offer them for what they may be worth.

(1) I wired in a miniature 12 volt lamp for the S meter as suggested in June AR but with a slight alteration. The miniature lamp I bought was supplied with a rubber grommet, which I trimmed as indicated in Figure 1. I cemented the grommet, rather than the lamp itself, above the S meter, and then pushed the lamp through the grommet. This makes replacement of the lamp a very simple matter. (The leads to the lamp are taken, as you suggested, to the three lug strip above the chassis to the rear of the main dial.)

(2) An annoying feature of the FRG7 is the dial set knob which protrudes barely a millimetre or two through the front panel. Now, it is obvious that continual use of

this knob is certain to cause wear of the panel surface at this point, not to mention disfigurement, if not obliteration, of the lettering above it. A simple solution is to take a black plastic LED socket, file its interior to fit the metal knob of the dial set, and cement it in place. It offers a firm purchase for the fingers, is not obtrusive and blends perfectly with the design of the front panel (Figure 2).

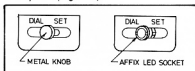


FIGURE 2

(3) Another criticism of the FRG7 concerns the main dial itself. The cursor is set forward at least one cm from the dial itself and this introduces a serious parallax error.

A simple solution would be to fit a highly polished thin metal band just above the dial markings. There are many ways,

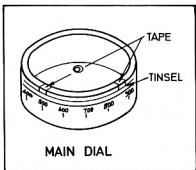


FIGURE 3

of course, of providing such a mirror backing, but after trying several, I settled for what I think is a very simple method. I bought a packet of "silver" tinsel, the kind that is used in Christmas decorations. The tinsel is only about 2 to 3 mm wide and is highly reflective. The tinsel is wound around the main dial drum at a height of about 1 mm above the figures on the dial and is secured at strategic points with transparent cellulose tape. Its use is simple: the crystal calibrator is switched on and the receiver is tuned for maximum S meter reading (on AM) or zero beat (on SSB) and the dial set adjusted until the cursor is lined up with its image in the tinsel.

This procedure of superimposing the cursor on its image is repeated when setting or reading frequencies on the dial.

The mirror scale harmonizes well with the general appearance of the receiver and the modification itself can be removed in seconds without leaving a mark.

(4) A deficiency in the FRG7 is the absence of an inbuilt crystal calibrator. Such a facility is essential in any serious communication receiver and can be provided for the FRG7 by means of a quite simple modification — *provided* one is willing to relinquish the rather doubtful advantage of being able to operate the FRG7 from dry cell! (This is to me a rather pointless facility: most amateurs or SWLs wishing to operate this receiver portable would surely have access to either the mains or to a car battery.) The LIGHT switch on the front panel is only a necessity if you wish to operate the FRG7 from dry cells, and if you are willing to forgo that facility, then you can use the LIGHT switch to operate an inbuilt crystal calibrator.

The modification is as follows:

- (i) Remove the two wires from the LIGHT switch, solder them together and tape the join. The LIGHT switch is now available for the calibrator.
- (ii) Remove the plastic dry-cell compartment on the sliding carriage at the rear of the receiver, first unsoldering the red and black leads from the white socket on the back panel of the carriage. Mount your calibrator circuit board and crystal on the sliding carriage as shown in Figure 4. The

(ii) Remove the plastic dry-cell compartment on the sliding carriage at the rear of the receiver, first unsoldering the red and black leads from the white socket on the back panel of the carriage. Mount your calibrator circuit board and crystal on the sliding carriage as shown in Figure 4. The

CQ OUTER SPACE

Perhaps one of the most fascinating aspects of radio is the eternal question, "Is anyone else out there?" Out there meaning the vast, limitless depths of interstellar space.

From time to time there appears short and frustrating bylines in the world's press that such and such a group of scientists in so and so a country has definite proof of the reception of intelligent radio signals from the cosmos. Like quicksilver these startling announcements suddenly appear and disappear, never to be heard of again. Russia and the United States are the chief sources of these singular revelations and it is in these two countries that the ominous cloak of secret military classification effectively silences further references to them.

OPTICAL LIMITS

Optical astronomy has almost reached its workable limits unless an observatory can be erected on the moon, free of the distorting effects of the earth's atmosphere. Even if this fantastic achievement was ever completed it would only increase optical penetration of the universe to another boundary. The only effective way we have today for a survey of the real depths of space is by radio astronomy. Space probes have and are being used as well, but these are almost exclusively confined to our solar system, but radio observations know no such confining limits.

The search for extraterrestrial life began as far back as 1892 when Nikola Tesla and Guglielmo Marconi both began to speculate on strange morse signals they received on their primitive wireless apparatus. Again in 1920 Marconi heard unidentified signals when he was engaged in reception experiments and these aroused so much interest in scientific circles in the US that on August 21st, 1924, all American commercial stations, including the high powered Navy transmitters, were silent for a period of five minutes each hour for eight hours. It was hoped this silent period would enable various listening posts to pinpoint the strange signals. The results were inconclusive owing to the very broad spark signals emitted by European transmitters who were not signatories to the American silence period.

MILKY WAY

It was not until 1939 that Grote Reber, an amateur located in Chicago, built to his own design a 10 metre metal dish and found that the entire milky way was a source of natural radio noise with several areas of very intense emission.

After World War 2 the search was taken up by Cocconi and Morrison of Cornell University who together wrote many papers on the subject, but were hampered by lack of search gear. They tried to involve Sir Bernard Lovell with the Jodrell Bank radio telescope in their enthusiastic plan, but in true British tradition he dismissed the idea as "trivial". He was later to accept the challenge in principle, but was not prepared to divert the Jodrell Bank radio telescope from its planned survey of flare and magnetic stars to undertake such speculative work.

In recent years there have been worthwhile attempts with radio astronomy to delve into the questions of life on other planets. Project Ozma undertaken by the United States was the biggest attempt of this nature and took place at Green Bank, West Virginia. Again several conflicting statements were issued at the conclusion of the tests, rather of a negative nature. The object of these activities is not an attempt to communicate with other worlds, but to listen to intelligent radio signals that may emanate from some far distant planet. It may be worthwhile at this stage to make clear two opposing views on the use of radio astronomy. The more staid, conservative school uses radio telescopes to listen to the natural radio noise that emanates from far distant galaxies. In this way deductions can be made to determine the nature of the awesome processes at work on newly formed or exploding nebulae and stars. Jupiter, in our solar system, is an excellent source of radio noise. The other school of radio astronomy is the one that concerns us. It is the use of radio telescopes to listen for intelligent transmissions in space. The equipment used in both cases is identical and comprises a large metal dish mounted on adjustable bearings that can be tracked to any point in the sky.

RADAR ECHOES

The giant telescopes of the world, such as Jodrell Bank and a newly completed one of immense size in the United States, are used almost exclusively by the first school, the staid conservatives. These installations are used to probe stars and constellations far out in space. By listening on various wavelengths (hydrogen gas has a frequency of 21 centimetres) innumerable deductions can be made regarding temperature, composition of atmosphere, etc. Even radar plays a part in these researches, but only with limited distances. For instance Venus is never seen, only the thick atmospheric cloud cover is visible, effectively hiding the surface of the planet. By means of radar this cover was penetrated enabling the planet's rotation period to be calculated together with its surface topography. This was accomplished in March 1961 using a wavelength of 2,388 mcs and a power of 12,600 watts and took place at the Deep Space Instrumentation Facility in America, the echo from Venus taking 6.5 minutes to return to earth. A further triumph was the first radar echo from the sun and later from Mercury. It was a scientist named van de Hulst who made the discovery that clouds of hydrogen gas emitted radio signals at 21 centimetres. It was the use of this wavelength that enabled scientists to map out the spiral arms of our galaxy which were invisible to conventional telescopes because of the massive dust clouds that intervened.

Returning to the subject of possible life on other worlds, it can be safely predicted that our own solar system is devoid of intelligent life capable of communicating with us. Our search must therefore extend to other constellations, the most suitable being Tau Ceti and Epsilon Eridani which might or might not have planets capable of supporting life as we know it.

The size and nature of their suns is used as a guide or yardstick to ascertain very roughly the conditions that might exist on their planets. As both these constellations are 11 light years away from us and as radio signals travel at 300,000 km per second, it would take (providing we had established there was a civilization able to converse with us) 11 years for our message to reach them and another 11 years for their reply to return. A total of 22 years for the complete message! A sobering thought indeed!

Another possible obstacle to our search is the stage of development reached by any alien civilization. Assuming there is an inhabited planet in a certain constellation with similar conditions to our own earth, for us to listen to their radio signals and later to communicate with them, they must be at a stage of development similar to us. If they were a thousand years ahead of us in development, it can safely be assumed that they would use some form of communication such as superior mental telepathy, ESP or perhaps a very advanced form of scientific visual communication. A thousand years behind us would mean they had just come out from the bow and arrow stage. Two or three hundred years would be nearer the mark, even then the balance would be critical. Consider our own scientific advances during the past one hundred years as a guide.

Another point worth considering is that assuming they were capable of monitoring our own radio spectrum and eavesdropping on our broadcasts from around the world, one can visualize their council of elders declaring "Leave well alone!" Going on our past and present record of international strife and bickering, could you blame them? Planet earth is not exactly an attractive proposition!

We now come to the last and, possibly, the most important aspect in our quest for life out there. It is the vast, incomprehensible distances involved in which time plays a decisive part. When one looks up at the stars at night, one is actually looking at the past. The light seen actually left many of those stars and constellations tens, hundreds and thousands of years ago and in fact, many of those stars no longer exist. The incredible distances involved are difficult to grasp mentally. For example, the nearest star to us called Alpha Centauri and Proxima Centauri (it is in fact a double star) whose light takes four and a half years to reach the earth, is a mere stone's throw away in astronomical distances. For comparison assume the sun is one metre away from us. Then this nearest star, Proxima Centauri, is 200 km away from us! The same applies to radio signals which also travel at the speed of light. If we did happen to hear an intelligent series of radio messages, the chances are that the transmission originated on a planet a hundred or so light years away. It is possible that its parent sun had exploded and become a supernova

during the time the signal took to reach us. That particular civilization could have equally well died out or decimated itself with an atomic holocaust during this period of time. In plain language we could be listening to something that did not any longer exist!

The prospect is not exactly encouraging. The best we can possibly accomplish at our present stage of scientific development is to listen and keep on listening. If we can prove beyond reasonable doubt that we have overheard and decoded an intelligent radio transmission, we will know, once and for all, that we are not alone and that there are others out in the cosmos, even if we are unable to communicate with them. It will also mean the adaptation of beliefs and dogmas of large sections of the world's population and a lot of scientific noses would be put out of joint!

The Russians are far ahead in this search. In 1973 the Soviet newspaper, "Tass", announced that the director of the Gorki Radio Research Institute had received signals of an unusual nature and did not resemble in any way the natural radio emissions from far distant galaxies. Other USSR scientists, among them Dr. Kardashev and Professor E. Trolitsky, are pioneering the search for intelligent transmissions. They too have received signals which they describe as being of regular character and in groups lasting from two to ten minutes in duration. In 1975 the Ural Research station also claimed to have received transmissions which are not natural but artificial in origin and sent by sophisticated radio equipment. It is high in these Ural mountains that the Russians are or have constructed a giant radio telescope about twice the size of the installation at Jodrell Bank. It is indeed a great pity that news and information of this kind cannot be pooled and shared among the scientific circles of the world. The United States are just as guilty in suppressing vital news of this nature and the press often omit news items dealing with the subject as of being of no consequence. Again the ugly word "military and secret classification" keeps a lot of information locked away. The lack of any information on UFOs is another case in point.

Another fascinating radio sideshow has been the perplexing echoes received from our own regular radio transmissions. These were first noticed during 1927 in Holland. A replica echo from a test broadcast which took from three to twenty seconds was noticed at irregular intervals over a period of several years. The normal rebound of a signal from the ionosphere takes about a fraction of a second depending on the wavelength used. What reflected these odd echoes? The Dutch transmissions were broadcast on 150 and, subsequently, on 31 metres and the echo times were identical. How did the signals penetrate the ionosphere and more strangely still, how did they return again through the reflective

layers? This phenomenon has been observed at odd intervals through the years, the last reports being in 1963 from Germany and Austria.

Even VHF and UHF have their quota of mysteries as illustrated by the following occurrence. During 1953 some UK television viewers were startled to see on their screens the identification card of TV station KLEE during a BBC church service. The image was strong enough to override the normal picture and remained visible long enough to be photographed by several people. The BBC engineers dismissed the whole episode as freak long distance pick-up from the United States until someone did their homework and discovered TV station KLEE went off the air permanently in 1950 and in fact the station had been dismantled when it was bought out by a rival network!

"Pirates!" screamed the engineers when they learnt of this new development, until someone came up with some very disturbing facts. If indeed it was a pirate station how was it viewed in various areas from one end of England to the other? TV signal propagation is limited to roughly a line of sight so how was this widespread coverage accomplished? It would require at least fifteen very powerful stations to cover the areas involved. The image lasted just over four minutes and was never repeated in spite of careful monitoring by the engineers, so the idea of pirates can be dismissed without further thought. What caused this odd occurrence? One of the photographs of the card as it appeared was sent to the Federal Communications Commission in America who handle the licensing of TV stations and it was compared to the original from defunct station KLEE. It was identical in every respect, even to a slight blemish in one corner!

How was this picture received on British television screens three years after the last transmission from Texas? Why was this particular low powered TV station chosen? Why was it only received in certain areas in England where a different type of transmission is used? Why was it seen only once and never again?

In conclusion, let me quote the chief engineer of the BBC when asked for his explanation of the mystery. "We are confronted with circumstances which are at variance with all accepted facts of television transmission. It is unthinkable that these signals could have been circling the earth for the period since that station last transmitted them. It is physically impossible that they could have been reflected by any celestial body in space at such a vast distance and received with such power: Power far beyond the limits of the original station. This leaves us with one remaining possibility, however bizarre, that this television signal was transmitted to us with intelligence and with a purpose, from a source and with an object presently unknown."

From Radio ZS November 1977. ■

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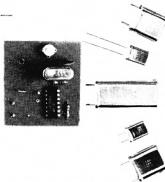
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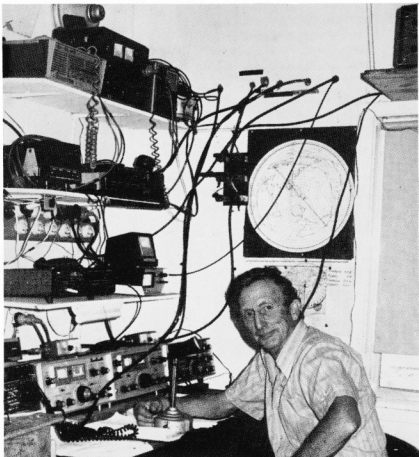
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THE MAN BEHIND THE MICROPHONE

David Thompson VK2BDT, President of the Goulburn Amateur Radio Club. David's QTH is just outside Goulburn. His tower was originally used at the old Goulburn Fire Station.

Photos courtesy of the Goulburn Evening Post.



WIA QSL BUREAU INFORMATION FOR NEWCOMERS — AND OTHERS!

To take full advantage of QSL bureaux certain rules should be observed. Some States have both an Inwards QSL Officer, and an Outwards QSL Officer, as in Queensland. The Inwards section handles incoming cards from both interstate, and overseas, and these are sorted, and eventually handed out to members at WIA meetings, etc., or, in the case of Country Members, posted by ordinary parcel post. Country members should insure that they have stamps, or stamped addressed envelopes lodged with the QSL Bureau to cover cost of postage.

QSL cards are proof of contact and should contain all relevant information,

such as Date, Time, Band, Mode, Signal strength, etc., and all times quoted should be in GMT (UTC) and the month written in words. This is because in USA 2-6-78 means 6th February 1978! Preferably cards should be small enough to fit an ordinary letter-size envelope, and on thin cardboard.

The call sign of station worked should be CLEARLY printed after the words "To Radio, . . .". Some newcomers are writing Christian names in this space, causing QSL officers to tear their hair out! Always pre-sort cards alphabetically, according to country prefix, with the exception of Australia and USA, when they should be sorted numerically according to States. Note: USA has eleven QSL bureaux.

If the station worked has a QSL manager handling his cards, please write his call in a prominent position, preferably in a different colour. Remember, your cards are handled by several persons en route. Postal authorities allow us to send cards in bulk at a special rate, but require that no more than five words be used in the remarks section.

Remember, bundles of cards that have not been pre-sorted, or are back-to-front, or upside down, are NOT appreciated by your voluntary QSL Officer who usually sorts thousands of cards at a time. In VK4 each outgoing QSL card must bear a 1 cent QSL sticker, available from the WIA (Q'd. Division) Secretary.

Fred Lubach VK4RF
Qld. Div. Outwards QSL Officer for past 8 years

Ian J. Hunt VK5QX

Vice-President and Federal Councillor,
Wireless Institute of Australia,
South Australian Division

THE RED CROSS MURRAY RIVER CANOE MARATHON

(IMPRESSIONS OF A VK5)

On Boxing Day 1978, having installed both the VHF (Kyokuto) and HF (TS520) in the car, I headed north-east from Adelaide, making for Kerang in northern Victoria, via Blanchetown, Renmark, Mildura and Swan Hill. Conditions for 20 metre mobile were excellent with short skip to VK2 and 3 and good contacts with friends in VK6. This allowed me to while away the driving time meanwhile, including contacts through both the Mildura and Swan Hill repeaters whilst in their service areas, with a promise to call in and see Ray 3BRB and Joan 3BJB to share a cuppa on the way back. A good test of the 60 watt 2 metre amplifier was provided by working Alex VK5CCT cross-band 2 metres/80 metres when approaching Kerang. Upon arrival at Kerang I found that Alex had everything well organised with four wheel drive Land Cruiser and trailer packed with absolutely all necessities, plus luxury such as 12V/240V car refrigerator to keep the important items cold. A quick transfer of my radio equipment (as back-up gear) and other personal necessities (spare pair of socks) to the Land Cruiser, a short visit to Alex father's home for refreshments and then we were away, headed further east to Yarrawonga and the starting place for the marathon canoe race.

This race, which is the longest canoe race in the world over 403 km (about 250 miles), has been run for the last nine years in aid of the Red Cross Society. Each year the VK3 Wireless Institute Civil Emergency Network provide communications support for this event, and it was for this reason I had travelled the 910 km (approximately) to both observe, learn and assist where possible in this operation. Arriving at the starting point where all the officials, canoeists, support groups and about 30 amateurs were camped on a local sporting oval, I was confronted by myriads of tents of all descriptions, hundreds of vehicles, and met with a cordial welcome by the VK3 group, immediately renewing old friendships and meeting new faces as well.

Night had by this time fallen and, following the usual social chatter commonplace amongst amateurs, a most comprehensive briefing by gaslight was conducted by John Payne VK3AED. As I was not the only newcomer to the group, John went to some considerable trouble in ex-

tending the briefing with an extra special section for those such as I who were not completely familiar with the organisation of the race and the radio nets so necessary to the safety and smooth running of the event. A little further social chat en-

sued and then it was sleeping bags ready and bed down for the night. Half expecting a rough shake and a "Wakey, Wakey, Rise and Shine" call in the morning I was pleasantly surprised to hear amid the twittering of the birds and, believe it, the



WICEN craft, with operators enjoying a "cool-off" in the Murray River



Ian Hunt VK5QX operating
one of the portable links

call of a kookaburra exhorting us to bestir ourselves at a fairly early hour, the strains of the song "Morning Has Broken" coming out over an amplifying system, and growing louder as the public address vehicle approached our portion of the camp. Such a romantic way to be awakened, camped next to the Murray River in a small Victorian country town. I might add that by the morning of the fifth day, after several late nights and early risings, "Morning Has Broken" had, however, lost a certain amount of appeal. Anyway, now for my first lesson in WICEN operation, Canoe Marathon Style.

At this point I feel I should explain how the organisation, nets, etc., were comprised and operated, together by necessity with some details of the canoe race itself. The race itself is divided into 5 daily periods with stages covered by the canoeists as follows: Day 1, 92 km; Day 2, 96 km; Day 3, 77 km; Day 4, 62 km; and Day 5, 76 km. The actual starting and finishing points are: Day 1, Yarrowonga to Tocumwal; Day 2, Tocumwal to Picnic Point; Day 3, Picnic Point to Echuca; Day 4, Echuca to Torrumbarry, then a portage section to Murrabit; Day 5 being from Murrabit to Swan Hill and finishing on New Year's Eve. Between the starting point (S—Sierra) and the finish (F—Foxtro) up to four land based check points are set up at the river's edge, these being designated points A—Alpha, B—Bravo, C—Charlie, and D—Delta. At all these points are located stations with both HF (3.6 MHz) and VHF (146.0 MHz) capability. Most, if not all stations, erect wire dipoles for HF and where possible gain antennas (beams, co-linears, etc., for VHF. At each of the check points Race Marshalls and First Aid personnel are also present.

The station at the start of the race is usually first to set up with the other operators proceeding by road to their nominated check points and coming on air as soon as possible. Up until such time as the station at the finish is operational the station at S—Sierra acts as Net Control, finally handing over an established net and Control to VK3AWI at F—Foxtro where the Race Information Centre (RIC) is also established. As well as these stations, others operating only on VHF are installed on power boats which take up position on the river approximately midway between each of the land check points. Thus a power boat mid-way between check points Sierra and Alpha is designated as being at Sierra/Alpha 5. The "5" indicates that the boat is approximately 0.5 of the distance between A and B, and should it move further downstream can indicate its estimated position as for example, Sierra/Alpha 9, i.e. 0.9 of the distance between S and A.

Each of the boats carries at least a complement of three, namely radio operator, First Aider and of course the skipper. Thus there is always someone in good position to both observe the canoeists,



Left to right: Nick Batten VK3NB, Ken Williams and Jack Batten socialise after a busy day

provide assistance where any is necessary and obtain help quickly where any is needed, and the safety of all participants is well assured. A further three stations are also involved. First of all, forward survey is carried out each day by members of the Land Rovers Owners Club (LROC) to ensure access to the check points along the river for the following day. A mobile station equipped with at least HF capability accompanies this group. Secondly, it can be definitely stated that communications at points along the course can at times be difficult, particularly on VHF, due

to vagaries of propagation, high river banks, dense foliage, etc. To this end a mobile station with both HF and VHF capability designated "Boat Relay" travels parallel with the river course keeping pace where possible with the main areas of activity so as to provide a "fill in" point for communications. The third station referred to is a Land Rover vehicle fitted out to provide service as a medical evacuation unit and designated Medivac 1. This vehicle also maintains its position in the area of major canoe concentration, however, being fitted with radio it can be

called upon at a moment's notice in the case of emergency. Thus the nets and stations are set up. Messages passed by the networks are varied in nature and typically may take the following forms.

1. Service Messages. These are messages originated by the participating stations and dealing only with operation of the net, station status, etc.
2. Urgent Messages. Matters of safety, first aid requirements, etc.
3. Routine Messages. Details of canoes started, numbers passed particular check points, withdrawals, etc.

The finish station (F), as mentioned before, is set up in conjunction with the Race Information Centre and normally located in the back of a large van. As the canoes, which totalled up to 385 in number, pass each check point along the river the marshall at the check point makes out a message detailing the canoe numbers concerned and hands it to the check point station for transmission to the control station and RIC. Such messages usually contain up to 25 numbers and were passed during the marathon with rapidity and accuracy. Experience in Contest operation would certainly be useful here. At the RIC a large board showing all canoe numbers and race sections is displayed. A golf tee placed opposite a canoe number beneath a check point number indicates the position of each canoe when last reported. Thus for interested spectator members of the public, supporters and land crews associated with the canoeists an almost immediate picture of canoe progress is provided, and organisers can keep themselves comprehensively informed as to what is going on. In the case of the boats, should any canoeist appear to be experiencing difficulties, such as favouring a shoulder, suffering from exhaustion or the like, the first aider doing the observation can radio ahead to the next land check point suggesting that the canoeist concerned should be called in and checked or any other appropriate action taken. Thus the importance of the radio facilities provided can easily be seen and the contribution to the safety of all concerned be understood.

Now for a few more of my own personal observations and experiences.

THE CANOEISTS

Sometimes quite a sight both on the water and out of their canoes. Faces covered with zinc cream, a weird assortment of hats, towelling covering their necks and paddling in such non-constrictive garments as pyjamas. In the showers at night displaying bruised and sometimes apparently painful red raw rear ends, and some blissfully appreciating the luxury of a shower after many long hours of paddling, seemingly unaware of the foam paddling still taped to upholster the said rear ends. A sight to behold indeed. Generally, however, quite cheerful and exchanging comments about conditions and how they are going.

THE OFFICIALS

The Marshalls obviously well aware of their jobs and very well organised. There were various categories of Marshalls such as Traffic, Check Point and Camp Marshalls. One thing amongst many did, however, impress me. At each of the stopping places each night, the whole entourage, approximately 4000 people in all, camped at the local football oval or showgrounds. Upon entering the said camping area we were greeted at the entrance by a camp marshall, directed to our particular area within the grounds and handed a large green plastic gar-bag within which to place our accumulated rubbish. The next morning after the camp was cleared these marshalls further ensured the tidiness and cleanliness of the area by collection of the gar-bags and any other litter left behind. Thus a most responsible approach to the local environment was generated.

ORGANISERS

These officials were most courteous and helpful and seemed well informed as to the whole operation. Questions were answered with no difficulty and in the main immediately.

RED CROSS

Meals were provided for supporting officials on payment of a small fee. However I had no need to avail myself of this facility as Alex VK5CCT had arranged to carry with his set-up enough provisions to my way of thinking to feed a small army anyway. Canoeists and their land support groups had, however, to fend for themselves. The Red Cross also ran a mobile stall where one could purchase such things as souvenirs, T-shirts, badges, stickers, drinking mugs, sun hats, etc. At each stopping place a "massage parlour" was set up where paddle weary competitors could go to stretch out on the tables and have their tired and aching muscles expertly eased by a rub-down. I didn't hear of any travel weary amateurs availing themselves of this service. I wonder if climbing trees tires one as much as paddling a canoe?

THE WICEN OPERATORS

Certainly a most self-reliant and versatile group. Setting up camp sites, repairing equipment, both whilst on the move and by torchlight at night on the bonnet of a motor vehicle. Unsoldering heavy joints on Alex's gas barbecue when repairing an antenna. Contributing useful suggestions at each briefing and pre-briefing at the end of each day. Charging batteries under adverse conditions, running power cables with a multitude of double adaptors, leads and outlet boxes where power could be obtained at a campsite. Fixing up broken leads, checking power meters, petrol generators, making new leads and antennas, organising makeshift stations and supplying extra equipment where needed. You name it, and they probably did it. Perhaps

an excerpt from the Melbourne "Herald" of 29th December, 1978, would not go astray at this point.

It read as follows:—

"SMOOTH RUNNING — BUT NOT FOR AIRWAVES"

"Radio messages vital to the safe running of the Red Cross Murray River Canoe Marathon were running hot yesterday. Amateur radio operators Peter Mitchell and Geoff Eley had smoke pouring out of their transmitters. Their zener diode and their power transformer had burnt out under the strain and no parts were available locally. But not to be put off the enterprising operators hit on the idea of getting the parts they needed from an old television set, and where better to find an old TV set but at the local Tocumwal tip. Sure enough a quick scour of the tip turned up a zener diode for Mitchell of East Brighton but Eley of Box Hill North did not have the same luck. And now the radio operators on the marathon have decided to form a raiding party to sift through the tip at each of their stopping places in search of the vital spare parts they need to keep their communications network. The operators are volunteer members of the Wireless Institute Civil Emergency Network who have given their time to help keep track of all the entrants in the marathon."

Well, some journalistic licence allowed perhaps, but the part about the zener diode and transformer was as stated. In view of the fact that many of the local service clubs along the river support this event to aid the Red Cross, we were a little concerned that some of them may have seen the newspaper article and decided to help us in their own way. Imagine waking up in the morning to find piles of old TV sets dumped outside your tent entrance!

The WICEN operators, both OM and YL, did however, apart from displaying their skill and versatility on the technical side, show a magnificent spirit of camaraderie, interest, dedication and helpfulness throughout the event despite the late nights and early mornings, tiredness, dust, ants, flies and at times primitive conditions prevailing. For this alone they are to be congratulated apart from the excellent job done in direct support of the event.

SETTING UP A CHECK-POINT

Throwing hefty adjustable spanners attached to cords through tree branches one could become an expert at, with the type of practice provided. A solid "star sinker" from a fishing kit did appear at one stage and proved to be a most useful missile for this purpose. Stringing out an 80 metre dipole through the scrub at the river's edge is, however, made more difficult by unco-operative trail bike riders who will insist upon riding over the antenna and tangling same in their rear sprockets even after having been requested to desist from doing so and to allow us to get the antenna into the air

and out of the way. We had our own satisfaction, however, in seeing one fall off after one tangle and another one of the bikes blow up its engine. Most unsporting of us maybe, but that's human nature on our part. The antenna still worked well after repair, too. Alex VK5CCT had as his installation an FT301 HF transceiver and Asahi centre loaded whip, Kyokuto 2 metre FM rig with a co-linear antenna bumper mounted, plus an assortment of antennas which could be strung up by various means. This equipment functioned well throughout both at fixed check points and also while mobile. 240 volt mains were found at times in the most unusual places along the river, however the 2.5 kVA generator did sterling work from time to time. The TS520 and back-up Kyokuto with 60 watt amplifier were pressed into service as control station on several occasions and worked well. Headphones were used quite often to obviate problems of local acoustic noise, noise between operators working side by side and to maintain a certain amount of privacy from the public where discretion was necessary or messages would appear to be of a sensitive nature.

A group of elderly fishermen provided some interest. Apart from a pleasant chat it was most interesting to see their "gold-mine". Layers of bank notes and newspapers spread on the ground. Yes, one of them had fallen into the river with all their fishing trip money and I came along as they were drying the money out. They were keeping a careful watch on it, however.

FINDING A CHECK-POINT

This can also be most interesting. Some of the check points are at almost inaccessible places and a network of un-signposted dirt tracks, if they can be called even that, can cause you to go in the wrong direction for a while. From Tocumwal to Check Point Bravo for Day 2 should have meant a distance of perhaps 50 kilometres. A tour through the southern Riverina area, eventually via Deniliquin and Mathoura close to where the day's run was to finish, then beating back through the scrub up river to the check point, to cover a total distance of about 17 kilometres, proved most interesting to us. Dusty though! We still made it before the canoes arrived. Better maps for this particular area would of course be helpful if they were available. I think they chose Alex for this one especially as he had a four wheel drive.

THE FINAL DAY (AND NIGHT)

—AND FUNNY SIGHTS

The last day of the Marathon found Alex and myself at a scenic spot on the river near the bridge at Murrabit. This time a smaller borrowed generator was used to power the TS520, the larger unit being loaned out for one of the other stations. The problem of a missing adaptor to suit the main lead to the Japanese generator

was solved by a call on VHF to one of the other operators passing nearby in his vehicle, thus obviating the need to plug in with bare wires held in place with match sticks. The problem of the transceiver not transmitting and receiving on the same frequency plus FMing of signals on receive was solved by running the generator to provide 240V 60 Hz, with the 50/60 Hz switch in the 60 Hz position and not the 50 Hz position for 60 Hz supply. A most unusual fault, as on receive in particular the current drain would have been very low. Has anyone an explanation? The race starter duly appeared with his list of canoes despatched to inform us also that it created a race record for the number of canoes to start on the fifth day. His opinion was that the excellent weather experienced was the reason. The really hot weather had not begun at this stage and competitors were finding conditions much to their liking.

Activities at the start having wound up, we enjoyed a pleasant chat with a Novice operator from the nearby New South Wales town of Barham who had heard the strong signals we were putting out and came to investigate. This area being the local stamping ground for 5CCT, we then travelled leisurely to visit some friends of his nearby and were treated to Christmas cake and rich milk coffee made with milk provided freshly from their own cow. Following this pleasant morning tea interlude we then travelled in convoy to Swan Hill, myself ferrying a vehicle for one of the operators whose duty for the day was on one of the power boats. Upon arrival at Swan Hill we proceeded to the Control Station at the finish line to which we had handed over the net somewhat earlier. I then provided some operating assistance while Alex set up camp at the Swan Hill showgrounds and then went back up river to provide another check point. Fortunately for me I had no duties to perform as the first of the canoes to cross the finishing line appeared around the island upstream of the finish. Whilst first across the line does not necessarily mean that canoe is the winner, as it is a timed event and six different canoe categories apply. I imagine that line hours do still mean something. The first two canoes to appear were Double Canadian types. Even after the last day's distance of 76 km, these two canoes crossed the line with the two paddlers in each paddling like crazy and with no more than about two feet separating them at the finish mark. Needless to say, the substantial crowd appreciated the battle waged and clapped and cheered for all they were worth. To make the finish more spectacular and exciting the official starter was there with his loud muzzle loading powder gun which he fired as the first canoe crossed the line. At this occurrence a very large brown retriever type bird dog, which had been standing near the river's edge, obviously watching everything with alert interest, apparently decided that someone had just maybe

shot a duck, and bounded forward into the water to begin swimming downstream after the canoes. The dog crossed the line in third place and gaining on the canoes at this stage. I could complete this part of my story by telling you that the dog then retrieved one of the canoes with its two occupants, but you probably wouldn't believe me! The last competitors arrived at the finish at approximately 7 p.m., following which the whole network finally closed down after a most successful five days of operation. This, however, was not the end of the event, as it was, after all, New Year's Eve. That evening the crowd gathered in the centre of the beautifully grassed Swan Hill showgrounds to witness the presentation of medallions to the placetoppers in each section and category, including the handing of perpetual trophies to the winners of each class. Then the New Year's Eve celebrations really began. Leading up to, through and just after midnight was marked by the booming reception of the 10 MHz timing stations WWV and JJY coming from the loudspeakers in one of the amateur operator's vehicles. By 0200 hours on New Year's Day I was observing one of the strangest sights I had seen in years. On every antenna on almost every vehicle crammed into the showgrounds between the myriads of tents and other equipment scattered about was placed an upturned empty beer can. This applied even to the vehicle broadcast antennas, and you can just imagine what a sight presented itself in the case of the radio amateur section of the camp with up to six antennas on a vehicle. I might add that later in the night I removed the beer cans from the antennas on our vehicle and replaced them with a soft drink can on the roof the Land Cruiser to indicate to all that Alex and I were of the sober gentlemanly type.

New Year's Day was then spent with Alex and his family at Kerang, meanwhile sorting out all the equipment and re-installing my mobile gear for the trip home. A most pleasant journey was begun early the following morning and with the sun behind me for most of the journey I returned along the picturesque Hume Valley Highway, operating again 20 metre and 2 metre mobile. By the way, I did call in for that promised cuppa at Mildura and spent a pleasant two hours with the husband and wife team of Ray and Joan 3BRB/3BJB.

Before closing I would like to say that I enjoyed very much the company and friendliness extended to a visiting VK5 operator by the VK3 WICEN Group on the Murray River Canoe Marathon. I learned much and had a most interesting experience overall. So, if you enjoy a challenge and are looking for adventure maybe you should talk to John Payne VK3AED and find out about assisting WICEN and joining in this and other like activities when they are held. ■

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AT-2000 is an antenna tuner required with each Kenwood as an antenna coupler. Although four wattmeter SWR meter and antenna selector switch, very easy for various kinds of antenna systems, connecting a transceiver with an antenna.



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The FH-3000 is a portable FM transceiver designed for use in the 20 MHz amateur radio band. It is small and light weight and is equipped with 12 crystal controlled channels for transmission and reception on F-3.



SP820 \$70.00 TS-820S \$1300.00 VFO820 \$185.00

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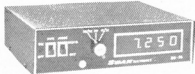
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NOVICE NOTES

SOLDERING HINT

With the Scope soldering iron wire a 6.3 volt dial lamp across the secondary of the Scope transformer. You'll know that good contact is being made inside the iron and it is heating up by noting that ring. The effect is due to the voltage drop which occurs when the iron loads up the transformer. If the globe doesn't lose brightness then don't wait too long finding out that it wasn't heating. The tip thread is probably dirty and needs to be screwed in and out a few times.

Before soldering, clean the surfaces, wires, etc., with scouring pad rather than steel wool. The scouring pad is non-conducting and broken-off pieces won't create short circuits in wiring later on.

(From Zero Beat, September 1978.) ■



80 Mx ACTIVITY

Stations heard on Saturday p.m. 6/1/79 from Riddell's Creek (north of Sunbury) on 80m. Samples taken every five minutes from 8.15 p.m. until 9.45 p.m. Band divided into 3 segments, 3.500-3.525, 3.525-3.625, and 3.625-3.700.

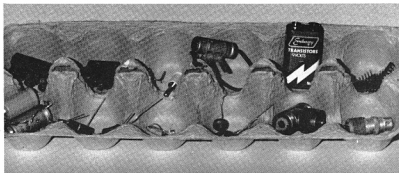
	3.500-3.525	3.525-3.625	3.625-3.700
8.15	0	12	2
20	1	14	4
25	1	14	3
30	2	16	3
35	1	18	4
40	2	10	4
45	1	14	3
50	2	13	3
55	3	14	3
9.00	2	14	4
05	3	13	3
10	2	13	2
15	2	14	3
20	2	15	5
25	3	17	6
30	2	13	5
35	1	13	8
40	2	16	7
45	1	14	7
Average	1.7	14	4.2



PIRATES ON TEN METRES

As you may already be aware, several suppliers have a range of crystals for the 27 MHz Marine transceivers which are called "Hi-side" crystals.

These are specially made receive crystals which are higher in frequency than the transmit crystal. The receive crystals are normally on the low side of the transmit crystal, which puts the receiver's image frequency right into the 27 MHz chook band channels, causing no end of interference.



EGG CARTON STORAGE

What to do with that old egg carton. One suggestion is use it as a temporary component holder, helps to keep the workbench a little tidier. ■

In order to help the poor 27 MHz Marine user, receive crystals for the high side of the transmit frequency are available, which puts the image out of the way of the chooks . . . and straight into the kilowatt alley section of ten metres. (But that's our problem, isn't it?)

Anyway, we now have a transmitter operating on or about 27880 kHz with a high-side receive crystal on or about 28335 kHz.

But then you take a second look at the frequencies in use for the crystals and you ask yourself: What if I reversed the crystals in the set so that the receive local oscillator is on 27880 and the transmitter on 28335, then I'd have a 28 MHz set operating on 28335. With the other crystals available, I could have 28345, 28355 and 28365 also.

I ask you then: What is to stop the pirate Hfer buying these crystals and doing just what I have suggested. The answer is nothing, nothing at all. While these crystals are really only suited for AM equipment, the chook that "wanted to get away from it all" cheaply and simply could do so with them.

Perhaps it will never happen that way. Perhaps, too, it would be a good idea to scan through the above frequencies to keep an eye on what activity springs to life. (You may even be so lucky to catch my wife VK2NID on 28335 using her handheld rig.)

So there is an idea for amateurs to get on ten metres AM with old chook band sets, and maybe the above frequencies could become a sort of standard channel arrangement for this type of equipment. If there is enough legitimate activity on those channels, then let the pirate beware.

(Note: If you were on 28335 and required some assistance in a hurry and had

no reply on that frequency, you could reverse the crystals and call on 27880. Another useful feature of the system.)

VK2ANF in QUA, Hornsby and Districts ARC, Vol 1, No. 4. ■



(From "SWARS", Dec. '78)

TRY THIS

WITH THE TECHNICAL EDITORS

HOME-BREW QSL

Stephen Garner VK2AXM
99 Macmillan Street, Seaford, 2092

Here is one method of home-brew QSL that may interest those who operate QRP (low finance).

The heart of the system lies in the fact that most "plain paper" photo-copying machines will accept lightweight cardboard as well as paper.

The paper size the photo-copier at work will accept is such that six cards can be produced with every print. So my master copy has six cards on it, each one an individual.

The master copy can undoubtedly be as intricate as one desires. Mine was fairly straightforward, the basic information was typed on, and my call sign was made out of letters cut from the afternoon papers. Rather along the lines of the ransom notes seen in the movies.

The cardboard I used is lighter than that found in most QSL cards, which probably pleases the Bureau. I was lucky enough to find a large pile of it in our attic, so there is no money outlaid there.

The quality of the card produced by this method is not "world shattering", but it makes a useful stopgap if one is anticipating a change of licence, e.g., novice to full call, which is why I originally used this system. ■

To Radio

Confirming

QSO with

V K 2 A X M

on at GMT
 Freq. Mhz
 Report, R S T
 Rx/Tx,
 Power, Watts In.
 Antenna,

Stephen Garner
 65-69 Kent Street,
 Sydney, NSW, 2000
 Australia
 Pse/Tnx, QSL, 73's

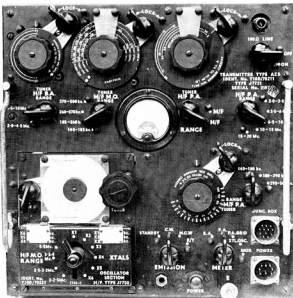
PORTABLE ARMY WIRELESS SETS OF WORLD WAR II

Compiled by R. Champness VK3UG
 Photos by Ken Reynolds VK3YCY

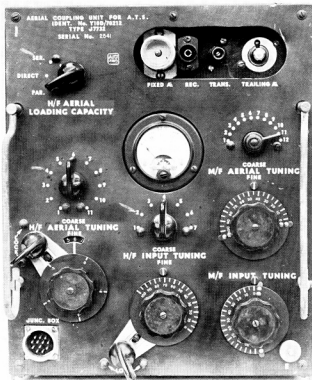
11. The AT5 transmitter is the companion to the AR8 communications receiver. In 8 frequency bands it covers 140 kHz to 500 kHz and 2 MHz to 20 MHz. It is VFO controlled on LF and MF and either crystal or VFO controlled on HF. The AT5 is designed to transmit AM/CW/MCW or pulse,

with an output power of nominally 50 watts. Like its companion receiver it was used in aeroplanes, ships and on land, an extremely versatile transmitter. The output stage of the transmitter consists of 2 — 807 in parallel, which are grid modulated for AM and MCW. Not an easy set to ser-

vice but patience and a copy of the handbook made the job possible. The set obtained power from 12 or 24 volt generators or from the type S 240 volt AC power supply. The current drain on 12 volts is of the order of 35 amps with the



ABOVE: Photo No. 11, the AT5 Transmitter.



RIGHT: Photo No. 12, AT5 Aerial Coupler

receiver and transmitter operating and the transmitter key down.

The AT5 proved to be a very popular transmitter with amateurs after the war of 1939-45. It had many modifications done to it, such as plate and screen modulation, operation on 160 metres, and so forth. They were used in the Antarctic and as bushfire brigade base stations in modified form. There are probably not many left operating now, but at one time were probably the most popular amateur home station transmitter in Australia.

12. Aerial Coupling Unit for AT5. This is used with the AT5 to match the transmitter to a rather wide range of aerials over a very wide range of frequencies. Like the transmitter it is arranged into two sections one section for MF and the other for HF so that things didn't become too complicated inside the unit. On the MF ranges the unit will match aerials which exhibit a resistive component of between 5 and 100 ohms and 95 and 500 pF reactive. On HF the unit will match end fed aerials much shorter than a quarter wavelength to considerably over a wavelength. A well designed unit of moderate efficiency. Not greatly used by amateurs as its features were not suited for most amateur aerials.

EDITORS NOTE:- This now completes the series in portable army wireless sets of WW II. Many thanks to Rodney VK3UG in collating the series and to Ken VK3YCY for the photography.

VK3JUV ■

AMATEUR SATELLITES

Bob Arnold VK3ZBB

AMSAT NEWSLETTER

I hear that the AMSAT Newsletter for December was delayed and therefore not completed until the end of January. This news letter may be sent by sea mail; if this is so receipt may not be expected before April. If you have any complaints regarding the delivery of the AMSAT News Letter please refer them direct to AMSAT.

OSCAR 7

The battery power of OSCAR 7 has now deteriorated to such a degree that all telemetry is unintelligible. As this satellite is now, unfortunately, unlikely to be worked again, no further predictions will be given.

OSCAR 8

This satellite is working well on both Modes and will probably remain our only satisfactory method of communication until Phase 3 is launched later this year.

From time to time AOB has operated on Modes A and J concurrently, having been programmed to do so for special purposes such as DX operations and special educational studies on Wednesday evenings.

RUSSIAN SATELLITES

Apparently both RS 1 and RS 2 continue to be in proper orbit although it has been

Channel No.	Address	Parameter	Measurement Limits	Decoding Formula
01	P	Calibration	01	—
02	C	Transponder Output Power (mW)	60-990	10 x N
03	F	Radiator Temperature (degrees-C)	—30 to +80	N
04	Z	Command/Telemetry Section Temp. (°)	—30 to +80	N
05	L	Power source voltage (V)	11 to 18	0.2 x N
06	B	Regulated voltage No. 1 (V)	8.5 to 9.5	0.2 x N
07	H	Regulated voltage No. 2 (V)	7.0 to 8.0	0.2 x N
08	O	Illumination on panel No. 1 (°)	01 to 95	—
09	W	Illumination on panel No. 2 (°)	01 to 95	—
10	K	Illumination on panel No. 3 (°)	01 to 95	—
11	U	Illumination on panel No. 4 (°)	01 to 95	—
12	G	Calibration	01	—
13	R	Transponder Output Power (mW)	60-990	10 x N
14	D	Body Temp. (°)	01	—
15	S	Battery charging current (ma)	0 to 500	10 x (50-N)

End of Frame-1. Each telemetry channel will end in either U (when transponder is OFF) or W (when the transponder is commanded ON), with either RS (when transponder is OFF) or RS RS (RS twice) when transponder is ON.

16	P	Battery No. 1 voltage (V)	11 to 18	0.2 x (N+12)
17	C	Battery No. 2 voltage (V)	11 to 18	0.2 x (N+12)
18	F	Battery No. 3 voltage (V)	11 to 18	0.2 x (N+12)
19	Z	Battery No. 4 voltage (V)	11 to 18	0.2 x (N+12)
20	L	Body temp. (°)	01	—
21	B	Power computing circuit temp. (deg. C)	30 to 80	N
22	H	Battery charging current (mA)	0 to 500	10 x (50-N)
23	O	Illumination on panel No. 1 (°)	01 to 95	—
24	W	Illumination on panel No. 2 (°)	01 to 95	—
25	K	Illumination on panel No. 3 (°)	01 to 95	—
26	U	Illumination on panel No. 4 (°)	01 to 95	—
27	G	Illumination on panel No. 1 (°)	01 to 95	—
28	R	Illumination on panel No. 2 (°)	01 to 95	—
29	D	Illumination on panel No. 3 (°)	01 to 95	—
30	S	Illumination on panel No. 4 (°)	01 to 95	—

End of telemetry Frame-2. Each channel ends with a K or an O. K when the transponder is commanded OFF, and O when is commanded ON. RS once when the transponder is OFF, and RS RS (RS twice) when it is ON.

(°) by command, there is a SHORT version telemetry of ONLY seven (from 01 to 07) channels.

noted that RS 2 is falling further behind RS 1 as each week passes.

As at the end of January, RS 2 was thirty minutes behind RS 1 and 5° further West at acquisition.

We still have little information on these satellites although the orbit predictions do seem to be reasonably accurate. The transponders are rarely operating although VK4ZIL does report communication on late night passes (South to North).

On many days during January, neither the transponder nor telemetry was heard but the reason for this complete close-down was not known. One can only hope that by diligent listening, it may be possible to find one or more satellites in working condition.

As indicated last month I am pleased to provide information on the telemetry system of the R.S. satellites. This information is produced by courtesy of QST of January 1979. As previously mentioned the telemetry information can be in the form of 7, 15 or 30 channels, each channel being in the form of 1 letter, 2 digits and a concluding letter, e.g. C18U. The information given below will permit interpretation of the telemetry.

ORBIT PREDICTIONS — APRIL 1979

OSCAR 8					RUSSIAN RS.1				
Date	Orb. No.	Eqz	Eqz -W		Orb. No.	Eqz	Eqz -W		
1	5459	0130	66	1876	0052	124			
2	5473	0135	67	1888	0056	127			
3	5487	0140	68	1900	0101	130			
4	5500	0002	44	1912	0106	133			
5	5514	0007	45	1924	0111	135			
6	5528	0012	46	1936	0115	138			
7	5542	0018	48	1948	0120	141			
8	5556	0023	49	1960	0125	144			
9	5570	0028	50	1972	0129	146			
10	5584	0033	52	1984	0134	149			
11	5598	0038	53	1996	0139	152			
12	5612	0044	54	2008	0144	155			
13	5626	0049	56	2020	0148	157			
14	5640	0054	57	2032	0153	160			
15	5654	0059	58	2044	0158	163			
16	5668	0104	59	2056	0002	135			
17	5682	0109	61	2067	0007	138			
18	5696	0115	62	2079	0011	141			
19	5710	0120	63	2091	0015	144			
20	5724	0125	65	2103	0021	146			
21	5738	0130	66	2115	0026	149			
22	5752	0135	67	2127	0030	152			
23	5766	0141	69	2139	0035	155			
24	5779	0003	44	2151	0040	157			
25	5793	0008	45	2163	0044	160			
26	5807	0013	47	2175	0049	163			
27	5821	0018	48	2187	0054	166			
28	5835	0023	49	2199	0059	168			
29	5849	0028	51	2211	0103	171			
30	5863	0034	52	2223	0108	174			

RS.2 is 30 mins. later. ■

AUSTRALIAN VHF CENTURY CLUB AWARD

Rules as amended 1.1.79.

OBJECTS

- 1.1 This Award has been created in order to stimulate interest in the VHF bands in Australia, and to give successful applicants some tangible recognition of their achievements.
- 1.2 This Award, to be known as the "VHF Century Club Award", will be issued to any Australian Amateur who satisfies the following conditions.
- 1.3 Certificate of the Award will be issued to the applicants who show proof of having made one hundred contacts on the VHF bands, and will be endorsed as necessary for contacts made using only one type of emission.

REQUIREMENTS

- 2.1 Contacts must be made in the VHF Band (Band 8) which extends from 30 to 300 MHz, but such contacts must only be made in the authorised Amateur Bands in Band 8.
- 2.2 In the case of the authorised bands between 30 and 100 MHz, verifications are required from one hundred different stations, at least seventy of which must be Australian. The Amateur Bands 50 to 54 MHz and 56 to 60 MHz will be counted as one band for the purposes of the Award.
- 2.3 In the case of the authorised Amateur Band between 100 and 200 MHz, verification from one hundred different stations are required.
- 2.4 It is possible under these rules for one applicant to receive two certificates, one for each of the authorised Amateur Bands nominated in Rules 2.2 and 2.3.
- 2.5 The commencing date for the Award is 1st June, 1948. All contacts made on or after this date may be included.

OPERATION

- 3.1 All contacts must be two-way contacts on the same band, and crossband contacts will not be allowed.
- 3.2 Contacts may be made using any authorised type of emission for the band concerned.
- 3.3 Fixed stations may contact portable/mobile stations and vice versa, but portable/mobile station applicants must make their contacts from within the same call area.
- 3.4 Applicants, when operating either portable/mobile or fixed, may contact the same station licensee, but may not include both contacts for the same type of endorsement.
- 3.5 Applicants may only count one contact for a station worked as a limited licensee with a Z or Y call sign who is subsequently contacted as a full AOC holder.

3.6 All stations must be contacted from the same call area by the applicant (except as below), although if the applicant's call sign is subsequently changed, contacts will be allowed under the same call area.

If the applicant moves to another call area, contacts must be made from within a radius of 150 miles of the previous location to qualify for award purposes. If the distance of the new location from the old exceeds a radius of 150 miles, a separate application for a new award must be made claiming only contacts made from the new location.

3.7 All contacts must be made when operating in accordance with the Regulations laid down in the "Handbook for the Guidance of Operators of Amateur Wireless Stations" or its successor.

VERIFICATIONS

- 4.1. It will be necessary for the applicant to produce verifications in the form of QSL cards or other written evidence showing that two-way contacts have taken place.
- 4.2 Each verification submitted must be exactly as received from the station contacted, and altered or forged verifications will be grounds for disqualification of the applicant.
- 4.3 Each verification submitted must show the call sign of the station worked, the date and time of contact, type of emission and frequency band used, the report and the location or address of the station at the time of contact.
- 4.4 A check list must accompany every application setting out the following details:
 - 4.4.1 Applicant's name and call sign, and whether a member of the WIA or not.
 - 4.4.2 Band for which application is made, and whether special endorsement is involved.
 - 4.4.3 Where applicable, the date of change of call sign and previous call sign.
 - 4.4.4 Details of each contact as required by Rule 4.3.
 - 4.4.5 The applicant's location at the time of each contact if portable/mobile operation is involved.
 - 4.4.6 Any relevant details of any contact about which some doubt might exist.
- 4.5 In lieu of forwarding QSL cards or other written evidence as set out in Rules 4.1 to 4.4 above, a list giving the details set out in Rule 4.3, certified by the Awards Manager, Secretary or Council Member of a Division of the Wireless Institute of Australia, or

two licensed amateurs known to the applicant, should accompany each application for membership or adjustment of verified country totals.

APPLICATIONS

- 5.1 Applications for membership shall be addressed to the Federal Awards Manager of the Wireless Institute of Australia, accompanied by the verifications and check list with sufficient postage enclosed for their return to the applicant, registration being included if desired.
- 5.2 A nominal charge of \$1, which shall also be forwarded with the application, will be made for the issue of the certificate to successful applicants who are non-members of the Wireless Institute of Australia.
- 5.3 Successful applicants will be listed periodically in "Amateur Radio". Members of the VHFCC wishing to have their verified totals, over and above the one hundred necessary for membership, listed will notify these totals to the Federal Awards Manager.
- 5.4 In all cases of dispute, the decision of the Federal Awards Manager and two officers of the Federal Executive of the WIA in the interpretation and application of these Rules shall be final and binding.
- 5.5 Notwithstanding anything to the contrary in these Rules, the Federal Council of the WIA reserves the right to amend them when necessary.

WORKED ALL VK CALL AREAS (VHF) AWARD

Rules as amended 1.1.79.

OBJECTS

- 1.1 This Award has been created in order to stimulate interest in sustained long distance working in the VHF bands in Australia, and to give successful applicants some tangible recognition of their achievements.
- 1.2 This Award, to be known as the "WAVKCA (VHF) Award", will be issued to any Amateur who satisfies the following conditions.
- 1.3 Certificates of the Award will be issued to the applicants who show proof of having made contacts with Australian Amateur Stations in the areas shown in the attached Appendix. The number of contacts required in each area is also shown.

REQUIREMENTS

- 2.1 Contacts must be made in the VHF Band (Band 8) which extends from 30 to 300 MHz, but such contacts

must only be made in the authorised Amateur Bands in Band 8.

- 2.2 Verifications are required from all of the call areas in accordance with the details given in the Appendix. A total of 22 confirmations will be required.
- 2.3 The commencing date for the Award is 1st January, 1958. All contacts made on or after this date may be included.

OPERATION

- 3.1 All contacts must be two-way contacts on the same band and cross-band contacts will not be allowed.
- 3.2 Contacts may be made using any authorised type of emission for the band concerned.
- 3.3 Fixed stations may contact land portable/land mobile stations and vice versa, but land portable/land mobile station applicants must make their contacts from within the same call area.
- 3.4 Applicants, when operating either land portable/land mobile or fixed, may contact the same station licensee but may not include both contacts in the one application.
- 3.5 Contacts made with ship or aircraft stations or contacts made with the aid of repeaters or translators of any kind will not be allowed.
- 3.6 Applicants may only count one contact for a station worked as a Limited Licensee with a Y or Z three-letter call sign, who is subsequently contacted as a full AOC holder.
- 3.7 All stations must be contacted from the same call area by the applicant (except as below), although if the applicant's call sign is subsequently changed, contacts will be allowed under the new call sign providing the applicant is still in the same call area. If the applicant moves to another call area, contacts must be made from within a radius of 150 miles of the previous location to qualify for award purposes. If the distance of the new location from the old exceeds a radius of 150 miles, a separate application for a new award must be made claiming only contacts made from the new location.
- 3.8 All contacts must be made when operating in accordance with the Regulations laid down in the "Handbook for the Guidance of Operators of Amateur Wireless Stations" or its successor.

VERIFICATIONS

- 4.1 It will be necessary for the applicant to produce verifications in the form of QSL cards or other written evidence showing that two-way contacts have taken place.
- 4.2 Each verification submitted must be exactly as received from the station contacted, and altered or forged verifications will be grounds for disqualification of the applicant.
- 4.3 Each verification submitted must show the date and time of contact, type of

emission and frequency band used, the report and the location or address of the station at the time of contact.

- 4.4 A check list must accompany every application setting out the following details:
- 4.4.1 Applicant's name and call sign and whether a member of the WIA or not.
- 4.4.2 Band for which application is made.
- 4.4.3 Where applicable, the date of change of call sign(s) and previous call sign(s).
- 4.4.4 Details of each contact as required by Rule 4.3.
- 4.4.5 The applicant's location at the time of each contact if land portable/land mobile operation is involved.
- 4.4.6 The call sign of the station worked.
- 4.4.7 Any relevant details of any contact about which some doubt might exist.
- 4.5 In lieu of forwarding QSL cards or other written evidence as set out in Rules 4.1 to 4.4 above, a list giving the details set out in Rule 4.3, certified by the Awards Manager, Secretary or Council Member of a Division of the Wireless Institute of Australia, or two licensed amateurs known to the applicant, should accompany each application for membership.

APPLICATIONS

- 5.1 Applications for membership shall be addressed to the Federal Awards Manager of the WIA, accompanied by the verifications and check list with sufficient postage enclosed for their return to the applicant, registration being included if desired.
- 5.2 A nominal charge of \$1, which shall also be forwarded with the application, will be made for the issue of the certificate to successful applicants who are non-members of the Wireless Institute of Australia.
- 5.3 Successful applicants will be listed periodically in "Amateur Radio".
- 5.4 In all cases of dispute, the decision of the Federal Awards Manager and two officers of the Federal Executive of the WIA in the interpretation and application of these Rules shall be final and binding.
- 5.5 Notwithstanding anything to the contrary in these Rules, the Federal Council of the WIA reserves the right to amend them when necessary.

NOTES

1. In areas above, where more than one confirmation is required, contact may be made with any or all of the Territories grouped together.
2. Where a Territory is no longer under Australian jurisdiction, contacts up to the date of independence will be accepted.

APPENDIX

Territory	Call Area	QSLs required
Australian Antarctica Heard Island Macquarie Island	VK0	1
Australian Capital Territory	VK1	1
Lord Howe Island State of New South Wales	VK2	3
State of Victoria	VK3	3
State of Queensland Thursday Island Willis Island	VK4	3
State of South Australia	VK5	3
State of Western Australia	VK6	3
Flinders Island King Island State of Tasmania	VK7	3
Northern Territory	VK8	1
Admiralty Islands Bougainville Island Christmas Island Cocos Island New Guinea New Ireland Norfolk Island Papua	VK9	1

HEARD ALL VK CALL AREAS (HAVKCA) AWARD

Rules as amended 1.1.79.

OBJECTS

- 1.1 This Award was created in order to stimulate interest in the logging, by both Australia and overseas Short Wave Listeners, of the various call areas of the Commonwealth of Australia and its Territories, and to give successful applicants some tangible recognition of their achievements.
- 1.2 This Award, to be known as the "HAVKCA Award", will be issued by the Wireless Institute of Australia to any Short Wave Listener in the world who is a member of an affiliated society of the IARU who satisfies the following conditions. An SWL resident in Australia or its Territories may be eligible for the Award.

APPENDIX

Territory	Call Area	QSLs required
Australian Antarctica Heard Island Macquarie Island	VK0	1
Australian Capital Territory	VK1	1
Lord Howe Island State of New South Wales	VK2	3
State of Victoria	VK3	3
State of Queensland Thursday Island Willis Island	VK4	3
State of South Australia	VK5	3
State of Western Australia	VK6	3
Flinders Island King Island	VK7	3
Northern Territory	VK8	1
Admiralty Islands Bougainville Island Christmas Island Cocos Island New Britain New Guinea New Ireland Norfolk Island Papua Territory	VK9	1

Reply Coupons are required from overseas applicants) must be enclosed to cover return postage of the cards to the applicant.

5.2 Applications will be examined by the Federal Manager, who will arrange for the Award to be forwarded direct or through the applicant's Society as required.

5.3 In all cases of disputes, the decision of the Federal Awards Manager and two officers of the Federal Executive of the WIA in the interpretation and application of these Rules shall be final and binding.

5.4 Notwithstanding anything to the contrary in these Rules, the Federal Council of the WIA reserves the right to amend them as necessary.

NOTES

1. In areas above, where more than one confirmation is required, contacts may be made with any or all of the Territories grouped together.

2. VK9: Where a Territory is no longer under Australian jurisdiction, contacts up to the date of independence will be accepted.

WORKED ALL VK CALL AREAS (WAVKCA) AWARD

Rules as amended 1.1.79.

OBJECTS

1.1 This Award, to be known as the WAVKCA Award, is offered by the Wireless Institute of Australia as tangible evidence of the proficiency of overseas Amateurs in making contacts with the various call areas of the Commonwealth of Australia.

1.2 The Award may be claimed by any Amateur in the world who is a member of an affiliated Society of the IARU, but no Australian Amateur will be eligible.

REQUIREMENTS

2.1 A handsome Certificate will be awarded to any applicant who makes contacts with Australian Amateur Stations in the areas shown in the attached Appendix. The number of contacts required in each area is also shown, a total of 22.

OPERATION

3.1 Contacts between overseas stations and Australian stations must have been made on or after the 1st January 1946.

3.2 Contacts may be made using any authorised frequency band or type of emission permitted to Australian

Amateurs, but crossband contacts will not be allowed.

3.3 No contacts made with ship or aircraft stations in Australian territories will be eligible, but land-mobile or portable stations may be contacted provided the location at the time of contact is shown on the confirmation.

VERIFICATIONS

4.1 The applicant must submit documentary proof, in the form of QSL cards or other written evidence, confirming that two-way contacts have taken place. Such verification must show the date and time of contact, the call sign of the station worked, type of emission and frequency used, signal reports and location (in the case of portable or land-mobile operation) of the stations contacted.

4.2 Verification must be submitted exactly as received, and forged or altered evidence may result in the disqualification of the station concerned.

4.3 A list, in accordance with the details required in Rule 4.1, must be submitted with the application for the Award.

APPLICATIONS

5.1 All claims for the WAVKCA Award must be made by the submission of

1.3 A certificate of the Award will be issued to the applicants who show proof of having logged stations in all the Australian call areas as listed in the Appendix. No endorsements are available.

REQUIREMENTS

2.1 Verifications are required from all the call areas of Australia and its Territories as shown in the Appendix. In all, 22 verifications are necessary.

2.2 The commencing date of the Award is 1st January, 1946. All loggings made on or after this date may be included.

OPERATION

3.1 Loggings may be made of Australian stations using any authorised frequency band or type of emission permitted to Australian amateurs.

3.2 Credit may only be claimed for logging stations using regularly assigned Government call signs.

3.3 Logging of ship or aircraft stations in Australia or Australian Territories will not be eligible, but land mobile or portable stations may be, claimed provided their specific location at the time of logging is clearly shown on the verification.

VERIFICATIONS

4.1 It will be necessary for the applicant to produce verifications in the form of QSL cards or other written evidence showing that specific loggings have been made.

4.2 Each verification submitted must be exactly as received from the station logged, and altered or forged verifications will lead to the disallowance of those items and may lead to the disqualification of the applicant.

4.3 Each verification submitted must show the date and time of transmission, type of emission and frequency band used and the location or address of the station at the time of logging.

4.4 A check list must accompany every application setting out the following details:

4.4.1 Applicant's name, SWL number, if any, and address.

4.4.2 Name of affiliated Society (see Rule 1.2).

4.4.3 Details of each logging as required by Rule 4.3.

4.5 In lieu of forwarding QSL cards or other written evidence as set out in Rules 4.1 to 4.4 above, a list giving the details set out in Rule 4.3, certified by the Awards Manager, Secretary or Council Member of an affiliated Society, or two licensed amateurs known to the applicant, should accompany each application.

APPLICATIONS

5.1 Applications for membership shall be addressed to the Federal Awards Manager, accompanied by the verification cards and the check list (Rule 4.4). Sufficient postage (International

the confirmation (Rule 2.1), together with the list (Rule 4.3) direct to the Federal Awards Manager. Sufficient International Reply Coupons must be enclosed to cover return postage of the confirmations to the applicant.

- 5.2 Where a reciprocal agreement exists between the WIA and the applicant's Society, the appointed officer of that Society will carry out the check, and if correct, will forward a written application for the Award on behalf of the applicant, together with the list (Rule 4.3).
- 5.3 Applications will be examined by the Federal Awards Manager, who will arrange for the Award to be forwarded either direct or through the applicant's Society. The Federal Awards Manager's decision on the application and interpretation of these Rules will be final and binding.
- 5.4 Notwithstanding anything in the Rules to the contrary, the Federal Council of the WIA reserves the right to amend these Rules as necessary.

APPENDIX

Territory	Call Area	QSLs required
Australian Antarctica Heard Island Macquarie Island	VK0	1
Australian Capital Territory	VK1	1
Lord Howe Island State of New South Wales	VK2	3
State of Victoria	VK3	3
State of Queensland Thursday Island Willis Island	VK4	3
State of South Australia	VK5	3
State of Western Australia	VK6	3
Flinders Island King Island State of Tasmania	VK7	3
Northern Territory	VK8	1
Admiralty Islands Bougainville Island Christmas Island Cocos Islands Nauru New Guinea New Ireland Norfolk Island Papua Territory	VK9	1

NOTES

1. In areas above, where more than one confirmation is required, contacts may be made with any or all of the Territories grouped together.
2. VK9: Where a Territory is no longer under Australian jurisdiction, contacts up to the date of independence will be accepted.

WORKED ALL STATES (AUSTRALIA) AWARD

Rules as amended 1.1.79.

OBJECTS

- 1.1 This Award has been created in order to stimulate interest in the VHF/UHF bands and is of a high standard to fully acclaim the proficiency of the recipients on their achievements.
- 1.2 This Award, to be known as the "Worked All States (Australia) Award", will be issued to any amateur in Australia or overseas who satisfies the conditions following.
- 1.3 A certificate of the Award will be issued to applicants who show proof of having made two-way contact with the specified areas of the Commonwealth of Australia. Additional credit will be given for proof of contact with overseas countries, viz., New Zealand or Papua New Guinea. Countries, for the purposes of this Award, are set out in the Australian DXCC Countries List.

REQUIREMENTS

- 2.1 Contacts must be made on the VHF/UHF bands 52 MHz and above (Bands 8 and 9). Contacts made on 50-52 MHz prior to 1/4/64 will count towards the 52 MHz Certificate.
- 2.2 One verification from each of the following areas of the Commonwealth of Australia is required—
(a) Australian Capital Territory.
(b) New South Wales.
(c) Victoria.
(d) Queensland.
(e) South Australia.
(f) Western Australia.
(g) Tasmania.
(h) Northern Territory.
In all, eight verifications are required.
- 2.3 It is possible under these rules for one applicant to receive one Award for each of the authorised bands between 30 and 3,000 MHz.

OPERATION

- 3.1 All contacts must be two-way contacts on the same band and crossband contacts will not be allowed.
- 3.2 Contacts may be made using any authorised type of emission for the band concerned.
- 3.3 Portable operation will be permitted provided that the portable location shall be in the State in which the licence was granted and in the call area in which the licence was granted in the case of overseas operation.
- 3.4 All contacts must be made in accordance with the Regulations laid down in the "Handbook for Operators of Radio Stations in the Amateur Service" or its successor for Australian stations, or in accordance with those Regulations applying in the country of

the applicant in the case of overseas stations.

VERIFICATIONS

- 4.1 It will be necessary for the applicant to produce verifications in the form of QSL cards or other written evidence showing that two-way contacts have taken place.
- 4.2 Each verification submitted must be exactly as received from the station contacted, and altered or forged verifications will lead to the disqualification of the applicant.
- 4.3 Each verification submitted must show the call sign of the station, date and time of contact, type of emission and frequency band used, the report and the location or address of the station at the time of contact.
- 4.4 A check list must accompany every application setting out the details for each claimed station in accordance with Rule 4.3. If any contacts were made whilst portable, this must be stated and the portable location given. The applicant must also state whether or not they are a member of the WIA.
- 4.5 In lieu of forwarding QSL cards or other written evidence as set out in Rules 4.1 to 4.4 above, a list giving the details set out in Rule 4.3, certified by the Awards Manager, Secretary or Council Member of an affiliated Society, or two licensed amateurs known to the applicant, should accompany each application.

APPLICATIONS

- 5.1 Applications for membership shall be addressed to the Federal Awards Manager of the WIA, accompanied by the verifications and check list with sufficient postage enclosed for their return to the applicant, registration being included if desired.
- 5.2 A nominal charge of \$1, which shall also be forwarded with the application, will be made for the issue of the certificate to successful applicants who are non-members.
- 5.3 Successful applicants will be listed periodically in "Amateur Radio". Members wishing to have their verified country totals listed over and above those submitted at the time of application for membership, will notify these details, in writing, to the Federal Awards Manager.
- 5.4 In all cases of dispute, the decision of the Federal Awards Manager and two officers of the Federal Executive WIA in the interpretation and application of these Rules shall be final and binding.
- 5.5 Notwithstanding anything to the contrary in these Rules, the Federal Council of the WIA reserves the right to amend them when necessary. ■

AMATEUR RADIO INTRUDERS

Following a more direct approach by your Intruder Watch Co-ordinator to our Administration they are becoming more sensitive and co-operative to our reporting.

Letters pointing out specific cases of persistent harmful interference to Amateur operators by intruding commercial stations have been sent, with the result that our official monitoring stations are looking into the intrusions and our Administration will file official complaints to the countries concerned.

Specific cases reported are as hereunder designated, but although such are in the limelight more reports would be appreciated —

Radio Tirana, broadcasting on 14330 kHz (now moved to 14320 kHz) at 0500 and 1100 GMT.

The A0 F1 signal on 14016 kHz which changes call signs almost daily, the latest being four letter with "2" inserted — e.g. "NTG2", "WU2H". This station is allegedly in the USSR but more reports are necessary.

The "Piccolo" signal on 21040 kHz needs more observations, as does a comparatively new one on 14080 kHz — VRQ. UMS an F1 signal on 21032 kHz transmits news and propaganda in English and other languages. MH22 an A1 on 21155 kHz has been a regular for many years. These all need further reports, bearing, traffic content, etc.

An excellent method of making the countries indulging in broadcasting and putting out harmonics in the 28 MHz band aware of the harmful QRM that they cause has been alerted to me. It brings instant results, and is a direct method that does not involve any official channels. After identifying the harmonic either by direct identification or by comparing it with the fundamental signal a QSL is made out on your normal QSL card, but crossing out "QSO" and inserting "Confirming your harmonic of kHz heard here at strength on (date) at (time) on a frequency of kHz. An excellent program causing harmful interference to amateur operators. Could you possibly remove the harmonic?" The second harmonic of Radio Paris on

14270 kHz was observed and a QSL sent. The result was a letter, a copy of which is hereunder reproduced. This is a translation from the French —
"Monsieur,

I thank you for your letter regarding the frequency 14270, harmonic of the transmission on 7135. The power of the transmission on 14270 is very weak but we are doing what is necessary to eliminate the annoyance. I hope to hear from you again, best wishes,

Chief of Broadcasting Services."

A QSL was also sent to Radio Peking which resulted in the recipient receiving a lovely 1979 calendar. Thus, as well as official complaints there are other more direct methods that get results, so GO TO IT, and good hunting.

Harmonics already identified are Radio Moscow on 28260, 28350, 28605, 28710; Radio Peking on 28308.

Alf Chandler VK3LC,
Federal IW Co-ordinator.

TECHNICAL CORRESPONDENCE

The Editor,
Dear Sir,

I refer to "Practical Hints", page 58 of December 1978 AR.

May I tactfully suggest that all aerial removal tests are inaccurate, misleading, and in case their staff's credibility suffered, were banned by the Victorian Radio Branch (PMG) way back in 1942.

Originally there were two such tests. Yours appears to be a combination of each. All suffer from pre-suppositional weaknesses, and would have died a natural death years ago if the users had understood electrical interference propagation. Because of this, I will very briefly explain.

The first of the two tests (paragraph 3) used to determine if the complainant had a faulty receiver or not "fell flat" when we discovered many receivers had noise producing faults, the noise from which ceased when we removed the aerial.

We, in the Radio Branch, considered the pointless second test, so beloved by "Mains Filter" manufacturers, "Noise Reducing Antenna" salesmen, and some "Technical Editors", to be very amusing. The manufacturer's uncorrected misleading advertisements advised noise potential customers to first disconnect their aerials. If the noise ceased, the interference was being received by the antenna. If the noise continued then it was mains-borne, etc.

I grinned every time I read them. The joke is that nearly all electrical interference is mains-borne, the odds against it being otherwise would be about one hundred thousand to one (100,000 — 1). To carry

the joke further, all mains-borne interference (including TV line oscillator interference) ceases when the antenna is removed. If the noise continues you almost certainly have a faulty set. (Glad you almost agree with us.—Ed.)

Obviously, the noise has to get from the mains into the aerial system. Most of it enters your home via the SEC service wires. It is then induced from your house wiring into your aerial system. Understanding mains-borne interference, or to give it its original name, "Radio Inductive Interference", enabled us not only to find and fix the 40 per cent audible noise heard at the complainant's premises, but the 60 per cent which we never heard. This was standard practice, every man was expected to use this simple system.

Noise investigation, as many people imagine, is not a perpetual series of "Fox Hunts". Like water flowing through a pipe, noise propagation is predictable. By phase transposition, low voltage noise can be diverted from a complainant's premises. Indeed officers of the SEC did this for me at least one hundred times, after unsuccessfully dealing with disagreeable owners of B & W TV sets, causing line oscillator interference. Noise generated in any phase of a three phase low voltage supply will normally confine itself to its own phase and will not "pass through" the transformer to which the three phases are connected. I know of one exception to this rule but I believe it, the device, died an evolutionary death.

If you have an outdoor antenna in the noise induction field of a HV line (usually 22 kV) the noise will not only be induced into your antenna, but will be in your house wiring as well. Listeners connected to all three low voltage phases will be affected, but remember that the actual HV noise source need not be nearby.

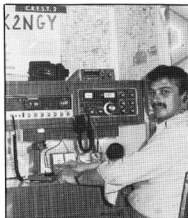
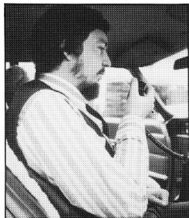
In Victoria (22 kV) this noise source might be up to seventy metallic miles away from a complaining B/C listener (case history). Luckily, because of harmonic attenuation, few amateurs, unless on 160 metres, would hear it at that distance. Noise from a HV fault has no boundaries. Although, in the true sense of the word, it does not radiate, it will, unlike a normal low voltage noise, "pass through" transformers, annoying people connected to all associated three phase low voltage reticulation.

Years ago, before most telephone lines were placed underground, it was not uncommon for a noise voltage, generated by a serious 22 kV HV fault, to be induced into adjacent telephone trunk lines. If these telephone lines were diverted across country eventually to run parallel to another HV line even 10 miles away from the first HV line, the original noise would then be induced into HV line number two. (Never underestimate a 600 ohm line.)

Cliff Manning VK3CJ

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IC-202E. 558 Portable Transceiver.\$229.
IC-225. FM 10 Watts 2M Mobile Transceiver.\$309.
IC-211. ALL Mode 2M Transceiver.\$770.
IC-280. Mobile 2M Digital Transceiver.\$449.
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DS-1A DC Converter TS-520-820.	\$79.
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AMATEUR RADIO LICENSING IN CANADA

Federal Educational Co-ordinator,
Graeme Scott VK3ZB

In Canada there are three levels of licence:—

1. Amateur Radio Operator's Certificate,
2. Amateur Radio Operator's Advanced Certificate, and
3. Amateur Digital Radio Operator's Certificate.

EXAMINATIONS

Candidates for the Amateur Radio Operator's Certificate, Amateur Radio Operator's Advanced Certificate or the Amateur Digital Radio Operator's Certificate are required to qualify in various sections as shown in Table 1.

The holder of an Amateur Radio Operator's Advanced Certificate may obtain an Amateur Digital Radio Operator's Certificate by qualifying in Section 2, Part IV, of that certificate.

The holder of an Amateur Digital Radio Operator's Certificate may obtain an Amateur Radio Operator's Advanced Certificate by qualifying in Section 3 of that certificate.

STUDY GUIDES

The following publications are suggested for the guidance of candidates preparing for examinations and may be obtained direct from the publishers or from book stores, except where otherwise indicated.

FOR AMATEUR AND ADVANCED AMATEUR

"The Canadian Amateur Radio Regulations Handbook" —
CARF,
Box 356,
Kingston, Ontario.
K7L 4W2.

"The Canadian Amateur Certificate Study Guide" —
CARF,
Box 356,
Kingston, Ontario.
K7L 4W2.

"The Canadian Amateur Advanced Certificate Study Guide" —
CARF,
Box 356,
Kingston, Ontario.
K7L 4W2.

"Ham Handbook for Beginners" —
ARTA Publishing Co.,
PO Box 571,
Don Mills, Ontario.

TRC-25 "Extracts from General Radio Regulations, Part II", obtainable from the
Department of Communications,
Ottawa, Ontario.
K1A 0C8, or
from any district office.

"Radio Act — General Radio Regulations, Parts I and II", obtainable from —
Department of Supply and Services,
Printing and Publishing Division,
270 Albert Street,
Ottawa, Ontario.
K1A 0S3.

"Eléments d'Electronique pour le Certificat de Radio Amateur", par —
Normand Bourgoin,
Librairie Beauchemin Ltee.,
450 rue Beaumont,
Montreal, Que.

"Comment Devenir Amateur", par —
Guy Cadieux VE2BTG,
4585 10e rue,
Laval, Quebec,
(Quebec).
H7R 2V9.

"The Radio Amateur's License Manual" —
The American Radio Relay League Inc.,
Newington, Connecticut,
USA 06111.

"The Radio Amateur's Handbook" —
The American Radio Relay League Inc.,
Newington, Connecticut,
USA 06111.

EXAMINATION CONTENT			
Type of Certificate	Radio Regulations (Section 1)	Theory (Section 2)	Morse Code (Section 3)
AMATEUR	Multiple choice 60 minutes Part I (a)	Written 60 minutes Part II	10 wpm for 3 minutes
ADVANCED AMATEUR	Multiple choice 60 minutes Part I (b)	Written 60 minutes Part III	15 wpm for 3 minutes
DIGITAL	Multiple choice 60 minutes Part I (b)	Written Part III Advanced 60 minutes Part IV Digital Technique 60 minutes	Not Required

FOR AMATEUR DIGITAL

"Systems Analysis for Data Transmissions", by
James Martin —
Prentice-Hall, Inc., 1974.

"Future Developments in Telecommunications", by
James Martin —
Prentice-Hall, Inc., 1977.

"Computer-Communication Network Design and Analysis", by Mischa Schwartz —
Prentice-Hall, Inc., 1977.

"Queueing Systems II", by Leonard Kleinrock —
Wiley-Interscience, 1976.

"Elements of Queueing Theory", by Thomas Saaty —
McGraw-Hill, 1961.

"An Introduction to Microcomputer — Volume 0 —
The Beginner's Book", by Adam Osborne —
Adam Osborne & Associates,
PO Box 2036,
Berkeley, CA, USA,
94702.

"Data Communications: Facilities, Networks and Systems Design", by Dixon R. Doll —
John Wiley & Sons, 1978.

"Computer-Communications Networks", by N.
Abramson and F. Kuo —
Prentice-Hall, 1973.

"Advances in Computer Communications", by W.
W. Chu —
Artech House,
Reprint Volume 1975.

"IEEE Transactions on Communications" —
Special Issue on Computer Communications,
January 1977.

"Principles of Data Communications", by R. Lucky,
T. Salz and E. Weldon —
McGraw-Hill, 1968.

"Error Correcting Codes", by W. Peterson —
MIT Press, 1961.

"Handbook of Pulse Digital Devices for Communications and Data Processing", by Harry E.
Thomas —
Prentice-Hall Inc., 1970.

"Basic Techniques in Data Communications", by
Ralph Glasgal —
Artech House, 1977.

"Home Computer Primer" —
Dilithium Press,
PO Box 92,
Forest Grove, OR 97116,
USA.

"Microcomputer Primer" —
Howard W. Sams & Co.,
4300 West 62nd Street,
Indianapolis, IN 46206,
USA.

"An Introduction to Microcomputers — Volume I" —
Adam Osborne & Assoc.,
PO Box 2036,

Berkeley, CA 94702,
USA.

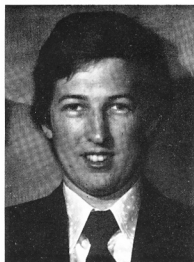
MAGAZINES AND JOURNALS

Byte: The Small Systems Journal.

AROUND THE TRADE

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QSP

USA CB SERVICE AT 900 MHZ

Yes, this is under consideration by the FCC in
replacement of the possible re-allocation of 220
MHz to the CB service according to a report in
QST December 1978.

AVAILABLE SOON

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RECOMMENDED FOR AMATEUR USE

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- **Star Features:**
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- 6 Digit Frequency Readout.
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- Approx. 20 watts output.

- Modes: LSB, USB, CW, AM, FM.
- Superior Receive Selectivity — Typical Shape Factor 3 dB/60 dB 1/25 (2 Cascaded Collins Mechanical Filters).
- Diode Ring Mixer with Broadband Load to Optimum Intermodulation Performance.
- 400 Hz CW Filter.
- Size: 6 1/2" x 2 1/2" x 8".
- 58 ICs, including 7 LSI Circuits.
- Watch this space next month for price.

P.O.A.

SL-55 AUDIO ACTIVE NOTCH FILTER DESIGNED FOR THE FT101E

Here is the Receiver Audio Active Filter that makes all others obsolete. The Electronic Research Corporation America Model SL-55 Audio Active Filter adds unequalled versatility in receiver audio processing for SSB and CW. This filter was designed, produced and made available to the amateur community only after painstaking research and field testing of its effectiveness in minimizing QRM.

Check these features:

Continuously tunable bandpass filter (not lowpass) so that the passband may be positioned anywhere from 200 to 1400 Hz. 3 dB bandwidth is continuously adjustable from 14 to greater than 2100 Hz (20 dB bandwidth from 140 to 2100 Hz).

Audio input and output impedance is eight ohms with one watt output capability.

Dimensions: 5.5 x 7.5 x 3.5 inches.

Available in grey to match FT101E.



\$129

Positioning of simultaneous notch filter is continuously variable from 300 to 1400 Hz with FINE and COARSE step controls. Notch depth is fixed at nominally 30 dB. Notch tuning is independent of bandpass tuning and may be completely disabled. Bypass switch restores the receiver audio output path to its original configuration. Power Requirements: 240V AC at less than 1/16 amp. No batteries needed.

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SCARCITY VALUE OF THE SPECTRUM

QST December 1978 contains articles relating to a possible new USA Federal Communications Act to replace the 1934 Act. One aspect of the new proposals relates to the possibilities of assessing licence fees on users of the spectrum in two ways: (1) the cost of processing the licence, and (2) the scarcity value of the spectrum being assigned. It is said that non-commercial radio services would be exempt from the "scarcity value" provisions of the licence fee.

NEW CALL SIGNS

The following call sign series have been allocated provisionally by the ITU according to IARU R1 Newsletter January 1979 — T2A to T2Z Tuvalu, Y2A to Y2Z German Dem. Republic.

and confirm a total of 46 contacts as outlined above to quality.

Application: Send log data and \$1 to Canadian DX Assn., PO Box 717, Station Q, Toronto, Ontario, M4T 2N5.

CALGARY AMATEUR RADIO ASSN.: STAMPEDE CITY CERTIFICATE

Requirements: Work any ten Calgary, Alberta, stations.

Application: No charge. Send log data only to Calgary Amateur Radio Assoc., Box 592, Calgary, Alberta, T2P 2J2.

Allen Smith VK2AIR of 111 Northcott Road, Seven Hills, N.S.W. 2147, has been appointed Secretary-Treasurer-Custodian-Editor of CHC Chapter (66) Australia, replacing Jack Gutcher VK3APU. Any enquiries should be directed to Allen.

THE DARWIN AWARD

The Darwin DX Working Group announce the introduction of "The Darwin Award". This award is available to amateur operators and SWLs for contacts with radio stations in the Greater Darwin area after 1-1-78.

Requirements: DX stations, work/hear 5 stations in the Greater area of Darwin. Any band or mode may be used.

VK and ZL stations work/hear 8 stations in the Greater Darwin area. Any band or mode may be used.

VK8 stations in Greater Darwin work 20 stations looking for the award or 15 VHF contacts with other Darwin stations.

Applications for this award to be sent (GCR) to The Awards Manager, PO Box 40986, Casuarina, NT 5792, Australia, with 5 IRCs to cover cost of postage.

This is my last contribution to AR as Federal Awards Manager. I hope that in the last five years I have provided some items of interest to you and that some of you, at least, have acquired some wallpaper as a result of the notes.

Your new Federal Awards Manager is Bill Verrall VK5WV, whose address is 7 Lilac Avenue, Flinders Park, SA, 5025.

Please forward all correspondence to him. Good hunting.

EDITOR'S NOTE: Thank you, Brian, for all of your assistance in the past. We welcome Bill Verrall as the new Federal Awards Manager (VK3UV).

BOOK REVIEW

"HOW TO IDENTIFY AND RESOLVE RADIO-TV INTERFERENCE PROBLEMS"

(Published by the FCC — available via MAGPUBS.) This booklet is aimed at informing television viewers, broadcast listeners, radio servicemen and amateur radio and CB operators of the various types of interference encountered by receivers in common use.

The first four pages are devoted to showing television viewers what the various types of interference look like on their TV screens.

The next four pages deal with the elimination of this interference.

Audio equipment and telephone interference is then dealt with.

Pages 10-20 deal with various remedies open to amateur and CB operators who have interference problems.

The last half of the booklet is an appendix listing the sources for assistance in resolving interference problems available in the USA. These sources are not necessarily available in Australia.

Interference to television and radio reception is handled in Australia by the Postal and Telecommunications Department whose addresses and telephone numbers are listed in capital city telephone directories.

VK3ASC.

AWARDS

COLUMN

Brian Austin, VK5CA

P.O. Box 7A, Craferas SA, 5152

Allen Smith VK2AIR has sent me a copy of the "Canadian Amateur Radio Awards Directory". This is a very useful aid to award hunter, and I can thoroughly recommend it. Copies are available from VE3HLI, E. S. Walden, Gowanstown, Ontario, Canada, for \$3 Australian currency. I am including details of two Canadian awards herewith:

TRANS-CANADA AWARD

Club: Canadian DX Assn.

Requirements: Work each of the 8 VE call areas with 5 contacts in each area (total of 40 contacts). Also work 5 stations in VO1 and VO2, any combination. Also work 1 VEO maritime mobile station. Of the 5 VE contacts one must be in the Yukon Territory and one must be on an offshore island of the North-West Territories. Stations must work

VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston, 5233

AMATEUR BAND BEACONS

Freq.	Call Sign	Location
50.023	HK2PR	Hall's*
50.025	6Y5RC	Jamieson
50.050	WATXN	Maine
50.080	T12NA	Coala Rica
50.087	WAGMHZ	San Diego
50.088	VE1SIX	New Brunswick
50.088	WABJRA	Los Angeles
50.092	W7KMA	Oregon
50.098	KG5JH	Guam
50.100	ZK1AA	Cook Island*
50.101	FO8BR	Tahiti*
50.104	VE1BGO	Pearl Harbour
50.110	HLWJ	Seoul
50.110	KG6JX	Guam
50.110	JY1AA	Marcus Island
50.110	KH6HK	Marshall Island
50.500	584CY	Cyprus
51.999	JY4PU	New Caledonia
52.110	HLWJ	Seoul
52.200	VK5VF	Darwin
52.300	VK5RTV	Perth
52.350	VK5RTU	Kalgoorlie
52.400	VK7RNT	Launceston
52.440	VK4RTL	Townsville
52.450	VK2WJ	Sydney
52.500	3D2AA	Fiji
52.500	ZL2VHM	Palmerston North
52.510	ZL2MHF	Mt. Climie†
52.500	JAZ1GY	Nagoya
52.800	VK6RTW	Albany
53.000	VK5VF	Mt. Lofy
53.100	VK0MA	Hawson
54.101	VK2WJ	Sydney
54.400	VK4RTT	Mt. Mowbullen
54.475	VK1RTA	Canberra
54.500	VK6RTW	Albany
54.700	VK3RTG	Vermont
54.800	VK5VF	Mt. Lofy
54.900	VK7RTX	Ulverstone
54.900	VK6RTW	Perth
54.950	ZL1VHF	Auckland
54.950	ZL1VHF	Waikato
54.950	ZL2VHF	Wellington
54.950	ZL2VHF	Palmerston North
54.950	ZL3VHF	Christchurch
54.950	ZL4VHF	Dunedin
54.950	VK4RBB	Brisbane
54.950	VK3RPX	Ballarat
54.975	VK7RTW	Ulverstone

NOTES:

* New beacon according to Bill Tynan of QST.
† Change of call sign from ZL2VHP to ZL2VHM and operating from a new location near Palmerston North, 175° 44' east, 40° 26' south, height 41 492 metres, 8 watts to turnstile antenna with FSK 800 Hz shift. This information is contained in a letter from Harry ZL2BFR, who also mentions a 6 metre beacon being commissioned by Upper Hutt Branch to be located on Mt. Climie 175° 29' east and 41° 13' south, 860m asl on 52.510, FSK every 10 seconds, call sign ZL2MHF and the antenna a vertical (?) dipole. This one is included in the present list as it could be operating by the time you read this. Thanks for the information, Harry.

‡ ZL2MHF, the new beacon referred to above. There is also a beacon operating on Gibraltar, signing ZB2VHF, frequency unknown, and has been heard as far away as PY1 and KZ5.

SIX METRES

The sporadic E (Es) season has been and gone to a large degree. The season was a relatively short one, with some good openings at times, but largely in the earlier part of the year, around Christmas and New Year. However, this is not entirely unexpected with rising sunspot numbers and one can probably expect similar conditions for the next two or three years. Compensation of course are the

increased number of long distance openings to Japan and other Pacific areas. As was outlined in last month's notes many areas have been worked from various States of the Commonwealth, although H44DX from Guadalcanal seems to have been rather elusive to many operators. A very good opening of some 4 hours to ZL from VK5 occurred on 14-17 with ZL1, 2 and 3 mainly being worked between 0800 and 1030Z, with signals to 5 x 4-F. The New Zealand contacts followed, rising MUF the day before when very strong FM signals were observed on the PRC10 on 38.3, 38.8, 39.3, 40.25, 41.9, 42.5, 43.8, 44.4, 44.7, 47.00. Weaker signals on 48.7 and 49.75 finally culminating in the first carrier being noted from Japan on 50.07Z at 0328Z weekly. J48RKC was observed on 50.100 later at 0408Z at 5 x 2 at this QTH. This again shows how the band can often be open up to 50 MHz and slightly above but not reaching 52 MHz at all. So we miss out on contacts!

VK5RO reported weak signals on 52 MHz all day on 15-1 from JA and YJ8. David VK5KK reported similar conditions on many of the following days, but the mainly strong signals were to be found on 50 MHz. It seems likely such conditions will prevail until March when the type conditions across return, and it is hoped continental USA will be worked from VK once more. I would expect many outstanding contacts to be made from Australia during March, April and May, but we will not be helped greatly by what has been arranged for northern hemisphere working, as outlined in the next paragraph.

JAPAN/AMERICA 6 METRE ARRANGEMENTS

From QST "During his November trip to Japan, WB6NMI discussed with several prominent and active JA six metre operators the question of frequencies to watch when conditions look favourable for US to JA work. The consensus was that on SSB we should aim for 50.110, which is not particularly heavily used in Japan. The JAs will transmit around 50.135. In Japan, as here, the first 10g kHz is restricted to CW. For that mode Louis suggests we call on 50.1 and listen on 50.090. This does not mean OSOs should not take place on a single frequency; these are merely the suggested places to monitor for signals from across the Pacific." So now VK stations can sit back and listen to the JA/VK contacts on 50 MHz during March and April, and biting your fingernails, wondering whether you should go down there and invite anybody up to 52 MHz, and be promptly investigated for doing so!

SIX METRES IN ZL4

Stan ZL4MB writes to say 6 metres was rather poor in ZL4 this year, as in VK. Contacts don't come easy from his place due to Flagstaff Hill, 2200 feet high, and effectively blocks all westerly contacts.

Active stations in ZL4 are Geoff ZL4PK, Peter ZL4LV, Bill ZL4KB, Gordon ZL4QO, Ken ZL4NR, Stan ZL4MB, Chris ZL4OV and Bernia ZL4IS, with Barry ZL4IP, Bill ZL4LT and Keith ZL4AL only able to listen at present. So it appears if the right conditions prevail there should be plenty of opportunities to work ZL4! Stan mentions also a 6 metre net which uses 52.050 on Sunday mornings 1000 NZ summer time, 2300Z. Thanks, Stan.

THE TASMAN EPIC

More news is coming to hand outlining the magnitude of the opening between Australia and New Zealand from 7th to 10th January on 2 metres and 70 cm. Jamie VK2YJ sends a rather comprehensive outline of the happenings, and although the main details were reported last month, a few more points are worthy of note.

CROSSING THE TASMAN

Not clear how the conditions extended in VK2, only one station in Blue Mountains area seemed to do much good. Most signals FM/SSB, to about 53, odd outstanding at times. Most gear at ZL and low powered, with vertical antennae for local working. Very few afterburners, few beams, only a couple larger than 5 elements. No large stacks it seems. ZL2 rare (at VK2BJQ anyway), heard one ZL2 repeater, worked one ZL on 144 SSB and one way 432 MHz.

ZLs seems to prefer odd frequencies for SSB. No real calling channel except perhaps 145.2! Seemed to avoid in general terms going much below 145 MHz. Most stations 145-146, some 146-147, 700 kHz split a problem, unless you had two rigs.

Did not at any time hear the ZL beacon. As far as I know none heard VK2WJ either. (Possibly elevation of beacons too high for type of opening . . . SLP.) At one stage could key up four Channel 4 repeaters, including Gold Coast. Heard only one VK4 all the time. Week-end before mass in version north/south, repeaters in VK2 and VK4. Assemblies, many long haul repeater and simplex contacts.

This is how it went. 7-17: First contact ZL10R/VK2AYC 0652Z with ZL repeater D. VK2AYC had first simplex 0920Z. (Also an ISO call from ZL to confirm if VK2AYC legitimate) from 0900Z contacts better. My log: 1152Z ZL11HP via Ch. D, ZL INT. 0935Z: ZL1TPB, ZL1TPJ, ZL1AQF, ZL1TWC. 0945Z: 2 x SSB to ZL1BPW 144.150 5 x 4, portable on hill, generator, 100W. Next two hours numerous VK/ZL through Channel 6 repeater at Newcastle, including Bar VK2ZAY.

8-17: 0815Z: VK2BBR Lismore 2 x SSB was mobile in car, 5/8 vertical whip 5 x 3, about 400 miles! 0822Z: ZL1AVZ broke in on SSB 144.2 off side of my beam, 5 x 8, 0825Z: ZL1AOX using FT200 and vert. ant. 5 x 6. ZL1AOF BOW 3 el. collinear at 10 feet. ZL1TVR BW to 2 x 1/2 waves at 15 feet! ZL1AOX: ZL1BPW: 40W to 4 x 4, at 24 feet. ZL1TFP: TS700S 5 x 3. ZL1TGS: 10245 to collinear. All these contacts were SSB both ways. At 0900Z repeater F came in to make numerous ZL contacts. About 0930 repeaters B to F inclusive all in. 1027Z: ZL1BPW via repeater C, also ZL1THZ. 0940Z: ZL1TGC on repeater B, no go on 432.190, 0945Z: VK2ZRT via repeater B, also ZL1TGC. 1100Z: VK2MQ SSB solo about 150 miles to ZL1TAT FM simplex. 1255Z: ZL1TTU, 100 miles from Auckland, Rep. B IC215 3 watts. Also ZL1THZ, ZL1TTE, ZL1TMV, VK2ZRT and ZL1AQF. Went to bed 1420Z.

9-17: 0737Z: ZL1TEE 2 x SSB 5 x 6. 0747Z: ZL1THZ. 0805Z: ZL1BDO 2 x SSB 5/8 vert. 10W. 0835Z: Channel 6 Newcastle, ZL/VK shambles! 0840Z: Repeater B in. 0850Z: ZL1TAT Channel 6 waiting for 432 signal. 0851Z: ZL1TAT 432.250 2 x SSB 5 x 2 to 5 x 5 to nothing. Received report 5 x 5 to 5 x 6. Continued this contact until 10251! 1000Z: ZL1TAT 432 MHz on sked, weak, but 2 way copy. 1125Z: Repeater B, numerous ZL. 1132Z: ZL1TUX 2 x SSB. 1138Z: Repeater D. 1302Z: Assofret VK/ZL via Ch. 6 Newcastle. 1304Z: Repeater F in, runs 2 watts ERP! ZL1TUX. 1320Z: D in again, QRT 1400Z.

10-17: 2012Z: ZL repeater B, to 9+ working assorted VK. Worked ZL10I, ZL1BZ, ZL1AC and ZL1AC1. 2107Z: ZL1AC1 2 x SSB 144.150 to 5 x 7 at best, 10W 100 foot coax to 5/8 ant. up 80 feet, 2 watts out! 2102Z: ZL2TAL. OSY to 432.190. 2135Z: ZL2TAL heard my CW and carrier 432.190, signs from nothing to S3/4's over next hour, with various checks on 144, which was going down fast. Local! Local! Repeater B still in QRT at 2300Z to work!

Information for the future. ZL repeaters as at 7-17:

A—146.200 (input), 145.500 (output); B—146.225, 145.525; C—146.300, 145.600; D—146.350, 145.650; E—146.400, 145.700; F—146.450, 145.750; G—146.500, 145.800.

Note 700 kHz downshift. During January openings B and D best and most persistent. F heard at times. E antenna wrong side of mast for VK. Did not hear A at any time, heard rest at some time. F runs 2 watts ERP. Simplex 146.000 popular, also 145.45, 146.050, 146.100, 146.150 and 146.500.

A letter a few days later from Rod VK2BJQ outlines a few more interesting points and are noted as follows: Thursday, 11-17, band nearly dead, couple worked mid-afternoon. Nothing after 0700Z 11-17. On Wednesday, 10-1, ZL1 mostly into Gosford repeater and best direct contacts were to the north of Sydney, near Blue Mountains. One station west of Sydney in mountains worked two ZLs during session. ZL2 rare here, but not so it seems in Gold Coast/Brisbane areas. A VK1 said a ZL heard briefly via Mt. Ginini repeater but not worked.

432 MHz

There have been many false rumours about the 432 MHz contacts I made, so to set the record straight, here are the details for everyone to read: Contact was arranged via Ch. 6 Newcastle. He (ZL1AAB) heard me first running carrier on his nominated frequency, both went to SSB. Contact started 0851Z, concluded 11 1/2 hours later. Reports were 5 x 6 at best, Ray copied me better than I copied him, copy here 90 per cent Q5. Have 10 minutes on tape, noise free at times.

ZL1TAB used Belcom Liner 70A with MA501 masthead pre-amp, and a 15 element log periodic yagi, about 15 watts SSB. The 70A is a 10 MHz device. VK2BQJ used a 432 MHz Microwave Modules transmitter running 91W watts T11 over 11 WINDQ style yagis fed with 7/8th inch CuZy cable — a bit better than FHJ5 cable at 70 feet.

A further sked for 1100Z SSB, heard both ways but signals weaker. On 10-11 arranged 144 MHz SSB sked with ZL2TAL, then QSY to 432 SSB. He copied my CW and carrier, but I only heard his carrier breaking at the appointed time. 144 was going down fast and eventually lost liaison. This attempt started 2130Z. The ZL repeater had been 9+ at 2000Z so we may have been a bit late. Lot of QSB. His signal not formally identified.

Thanks, Rod, for going to the trouble of outlining events, it was a great occasion for many stations, some will have done better than others. Some will be cursing their luck for not making it for a variety of reasons. Again congratulations to you, Rod for making it both ways on 432 MHz SSB.

A few lines included with the VK2BQJ letter gives some outline of events from VK4, 9-1; 0800 to 1200Z 144 VK4/ZL 10-1; 0700 to 1200Z same. ZL2 worked from Gold Coast, and ZL repeaters copied. Rod VK4ZQR had worked five ZL2s direct. Only one ZL1 heard — a marked distinction to VK2 efforts. VK4 also heard a ZL3. ZL2ARW working from a mountain top but had an enormous signal on SSB in Brisbane, but he had left his 432 gear home! (See "News from Queensland" at end.—Ed.)

Lionel VK3NM was rather a fortunate traveller, arriving in Newcastle during the big two metre opening, and promptly got amongst the ZLs himself. He used a TR7400A and a 5/8 whip to work direct ZL2BZF, ZL2TVY, ZL1TWA, ZL1AZB, ZL1UD, ZL1TLQ, ZL2BFA, ZL1BEX and ZL1TUX. VU2VZ was the one he worked ZL2BQJ and ZL1HP. No ZL3 or ZL4 heard. Signals from most of the stations were incredibly strong. Lionel reports, pinning the S meter at times. Stations running 10 watts or lower to simple 1/4 wave whips were S9 with little or no QSB. So you can be lucky sometimes. Lionel, being in the right spot at the right time! Thanks for writing.

To finish up the news on this big opening, perhaps it is ironic to read in the VHF notes in "Break-In", the New Zealand counterpart of AR, in the December 1978 issue, a report of the Christchurch Branch 05's VHF Group which considered proposals to change from the present 700 kHz offset in NZ to 600 kHz, which would be compatible with VK, but a clear case against the proposal was carried. I wonder if there will be any further discussion on the matter in view of what has just happened. I wonder how many contacts were actually not made as a result of many shacks not having additional equipment with which to accommodate the different offsets of the VK and ZL repeaters. Probably some never made it at all despite hearing one side of the conversations!

FIFTY MEGAHERTZ

I see by the VK6 VHF Group Bulletin that discussion was to be undertaken on the possibility of negotiating operation on 50 to 52 MHz. As good a thought as this might be, I still believe a fragmented approach by various groups to P. and T. will get nowhere. The matter needs to be initiated via the VWA level via the VHF Advisory Committee whom we would believe would be working towards this end. (They most certainly are.—Ed.)

It is my earnest hope P. and T. will not drag their feet to the extent that ultimate permission may be granted for some form of operation on 50 MHz at a time when it is too late for any worthwhile contacts to be made. There still seems to

be really no worthwhile reason why 50 MHz operation cannot be permitted on a non-interference basis — that situation exists already on 52 MHz — you try to continue to operate at present on 52 MHz whilst interfering with your neighbours and see how far you will get, whether your equipment is blameless helps very little when the crunch comes.

Initially there seems no reason why we cannot be allowed to go down to 50 MHz area and call an overseas station, and invite him to move up to 52 MHz. If he cannot do this then a short QSO should be permitted with an OVERSEAS station on 50 MHz. There are plenty of areas outside Channel 6 territory which will not interfere with television viewers, and those in Channel 0 territory would probably continue to operate on the limited scale they do at present, but at least would be permitted to have QSOs outside television hours, and let's face it, late night contacts will be part of the TEP situation as the peak of the present cycle approached. Such an arrangement could well suffice for the time being whilst the total implications are studied by P. and T. and others. It will help to keep all contacts fully legal whilst permitting VK stations to participate in the world wide contacts which will probably be available in the near future.

THE PRC10 RECEIVER

The paragraph I ran recently on the ex-Army 38 to 55 MHz transceiver type PRC10 has caused quite a degree of interest. If the number of interstate phone calls I have received for further information is any indication, the PRC10 will be a useful instrument to monitor the MUF may be interested in the socket connections for feeding power into the unit. The 8 pin socket at the bottom of the unit are connected as follows: A and B: 1.5+ volts; C is earth; D 135+ volts; E 67.5+ volts; F not connected; H —6 volts; J is A—, B—, and C— which are connected to earth. The PRC10 is isolated in your power supply for switching purposes. 135 volts is used for the transmitter and requires 27 mA. 67.5 volts is used for the transmitter also at 12 mA and for the receiver at 26 mA. This voltage is critical for the receiver, anything below 67 volts and the receiver performance falls off rapidly. 67 to 75 volts would be ideal. 1.5 volts at 0.48 amps for the filaments. This is dropped to 1.25 volts internally for the filaments. This voltage also supplies the dial light and the calibrator. The —8 volts at 300 mA is used for the transmitter valve filament and the squelch relay. Well filtered DC is required for 67.5 volts for the receiver and 135 volts for the transmitter, and exceptionally well filtered and/or regulated 1.5 volts for the filaments. A PMG type cell could possibly suffice here if you are only going to receive. The unit is a wide band FM device and readily resolves the television audio; transmitter output 600 mW, audio output power about 30 mW. To raise the level of the audio, extra and the two levels which connect to the headphone and connected these to the audio end of a cheap 5A AM transistor radio from K-Mart, and this gives ample output for listening. The antenna as mentioned previously, is a Hills TSL01 which is a colour TV antenna for use in Channel 0 areas. Fed with ET10M 75 ohm coax it provides probably 4 to 10 dB of gain over the frequency covered in the unit, and in my case this antenna can be rotated and is about 58 feet high.

The PRC10A is a later version of the PRC10 but is a little different inside. It appears to have one less IF stage and a few other changes, but I see no reason why it should not be a good monitoring receiver as well. The PRC10 is terrific for monitoring. I have extremely strong signals here from the local TV stations, but no signals of any rubbish between 38 and 55 MHz. Every signal heard on the PRC10 comes from somewhere else, mainly the north! There is also a PRC9 which covers from about 27 to 38 MHz, but is not so suitable for our present use, but would be a useful adjunct to the PRC10.

REPEATER

Ian VK5IK at Eudunda, some 70 miles NE of Adelaide, seems to enjoy another set of reception conditions which seems to elude those living further south. He reports in another letter this

month the reception of various FM repeaters and some simplex operation, e.g. 5-1-79: 1230Z: Channel 4 Bendigo, Channel 8 Mildura both audible, with Channel 7 Mt. William very strong. 6-1: 1448Z: Channel 3 Ballarat, 2252Z: Channel 3 fair, Channel 4 Bendigo and Channel 6 strong. VK3BM S9+ on direct path, Channel 8 3MRA strong, 9-1: 1312Z: Channels 3, 4 and 7 audible increasing to 9+ late evening and early morning. 13-1: Channel 7 3RWZ audible, 14-1: Channel 4 and Channel 7 Channel 15-1: 1013Z: Channel 3 3RWZ Wags 9+ for most of morning, Channel 7 3RWZ 9+. Channel 7 1RGI S8. This latter reception apparently was not following the usual set of conditions, as the south repeaters were not being favoured, as 3RWZ normally captures any signals transmitted. Channel 8 3RNE and Channel 3MRA also good strong. 2335Z: VK221 in Broken Hill worked on Channel 40 and he was able to access Channel 5 Adelaide.

With this sort of capability, Ian, we hope you will try to be able to stir up some interest in VK3 via the repeaters to try some contacts around the country on SSB on 144 MHz. Suitably equipped stations in the areas mentioned should be able to make contact from time to time.

EME REPORT

"The Propagator" reports for December 1978 that a meeting of the University of Wollongong staff, attended by Lyle VK2ALU, affirmed that the 432 MHz dish at Dapto should be shifted to the new site if costs are satisfactory. A secure building would be erected next to the dish by the University, and the EME Group would only have to install the EME equipment and associated wiring and cables. So it looks as though in due course the project will once again be operational, this time we hope secure from the stupidity of vandalism.

NEWS FROM QUEENSLAND

Rod VK4ZQR has written with news of VHF happenings on behalf of the Brisbane VHF Group.

As far as 6 metres is concerned, it has not been particularly outstanding, especially as far as multi-hop Es, F or TEP are concerned. Quite a bit of interest has been stirred up by the increased YJ8, FK8 and VK9 activity. One interesting observation is that since the YJ8VP beacon has been installed it would seem the Brisbane-Port Vila path is more reliable than the Brisbane-Melbourne-Launceston-Adelaide paths. FK8AB and FK8AB report working JA and KH6 and hearing KR6, UK, UM, LZ2 (weak CW) all on 50 MHz, which makes one wonder what would be done if TVQ-0 didn't exist!

So far one JA opening for 1979 at 2300Z on 7-1, which looks as though it could be F2 rather than class 1 TEP.

On 2 metres tropo has been fairly prevalent during January. Areas concerned extend from New South Wales north to Rockhampton and west to Moree. Country stations particularly active include VK2BXT, Moree, VK2PU Kingscliff, VK2XZC Newcastle, VK2ZCV Port Macquarie, VK4FU Rockhampton, VK4RH near Warwick, VK4LE Springsure, VK4ZBI Rubyvale and VK4ZWH at Bundaberg, plus of course many Brisbane and Gold Coast stations. Notable exceptions were VK4RH to VK4FU, VK4LE and VK4ZBI. VK2BXT to VK4ZWH, and heard by VK4ZBI, VK2ZCV to Brisbane.

ZL stations have also been worked from this area recently, with ZL 2 metre beacons being heard from time to time. Most eventual contacts were made on 9-1 and 10-1, with ZL2 area being the most prominent, but ZL1 was also worked and ZL3 heard. The actual number of contacts made from SE Queensland do not appear to be nearly as many as from Sydney area and signals appeared to be good, especially on 9-1. Station close to the coast and further south had stronger signals. The other interesting point is that original polarization of the signals was maintained. Some new DX records from Queensland have been created, e.g. 4K4VC Nambour to ZL and VK2PU Kingscliff to ZL, both on 2 metres. As the actual locations of the various ZLs is not known, exact calculations as to distance at this stage are not possible, but it is fairly obvious existing records have been broken. Despite many calls nothing was heard on 432 MHz. Thanks, Rod, for writing.

GENERAL

The usual January openings on 144 and 432 MHz have been taking place between Albany and VK5, with some very strong signals at times. Two metres has also been open into VK3, especially the northern parts. Col VK5RO has been having constant contacts with Frank VK2ZJ in Broken Hill.

Letters are continuing to come in response to the two part article in AR on the return of the six metre band to amateurs. Whilst most consolidate the thoughts already expressed, it is pleasing to know the article hasn't gone unnoticed. The letters are filed for the future.

As there is not a lot of specific information this month, and we have had some good coverage of recent times, it seems appropriate to close at this point, wishing you all plenty of DX for the equinoctial period of March and April.

Thought for the month: "It is impossible to defeat an ignorant man in argument".

73. The Voice in the Hills.

NEWS FROM THE BRISBANE VHF GROUP

Further to the many enquiries received concerning the Group's range of YAGI antennae, this article lists full details of the range and prices. All orders from the Brisbane Metro area will be supplied pre-assembled, while those from other areas will be supplied disassembled, FOB rail.

To order any of the above antennae please write to: The Brisbane VHF Group, PO Box 911, Fortitude Valley 4006, stating (1) centre frequency (or frequency for crossed versions) and (2) the number of elements.

Band/elements	Bandwidth MHz	Boom length (metres)	Gain (dBd)	Price (\$)	Price (\$) (crossed)
2m/5	4	1.7	9.2	20	32
2m/7	3	3.1	10.7	25	40
2m/12	2	4.6	12.2	32	55
70cm/6	8	0.9	10.2	15	27
70cm/12	6	1.5	12.2	25	45
70cm/15	4	3.0	14.2	30	52

In addition to the above range, a number of combination antennae can be ordered. For example—

2m/5 and 70cm/12	3.7	40
2m/7 and 70cm/15	3.1	47

—From "QTC" February 1979 (VK4 AR insert).

YOU AND DX

Mike Bazley VK6HD
8 James Road,
Kalamunda, W.A. 6076.

The "art" of DX is a declining one. Like everything in this "Modern World", DX has to be instant. The emphasis seems to be on power (look at the advertisements in this Journal, those big linears must be selling) and the subscription to a DX Bulletin that tells you if you are on such and such a day on such and such a frequency then AB 12 ZC ZZ will be waiting for you.

Once upon a time you had to hear them to work them! This is now not necessarily true! If you do not agree with this statement then I suggest you listen to some of the DX nets (not all) and some of the DX operations controlled by an MC. In these cases first the "DXer's" call is put across and then he is asked "did he get his 5 and 9 reports?" All he has to say is yes and send the QSL with the necessary "green stamp".

Perhaps the above view is being a little bit cynical. This writer can understand why someone will pay \$1000 plus for an amplifier, when with a little bit of patience and know-how a very efficient radiating system can be made at a fraction of that price, with the added advantage of being able to hear the DX!

JANUARY DX

Stations mentioned below as being heard were all heard or worked from VK during the month of January.

FR7ZL, Guy, told this writer that he would be on Tromelin, FR7ZL/T, from the 2-29 to 4-4-79. Guy hopes to be active on both 15 and 20 CW and SSB. If you need Tromelin it might be worth checking the French net that is regularly active around 14110 kHz at approximately 1100-1200 GMT.

4U1UN is active usually one day (a week day) a week on 15 metres either around 2100 or 2120 to 2130 between 2200 to 2400 GMT.

Did you work TL9CCT? Sorry to tell you he is Central African Slim, operating from around JA. He has also been heard to sign TT8 and TN8.

HS1ABD, Fred Luan, has been active lately ditching out the SB WAZ QSOs. He has been heard on all bands and for those who need Zone 26 on 80 metres he is regularly on 3515/16 at about 1200 GMT onwards.

At the present time there is a large number of W stations active signing portable SU. For example WDSAJE/SU has been heard on all bands from 80 to 10m.

STORK, operator Hans, is still active from Southern Sudan and has been heard with good signals around 28600 at 1000 GMT. QSL via DL7FT.

TFSCW is trying to get his SB WAZ. He is looking for Zones 28 and 30 on CW all bands. Happy to make skeds. Has been worked on 15 metres.

BOUVET

What has happened to the Bouvet DXpedition? Lots of stations have been heard calling them, a few working them, but this writer has not heard of any QSOs with the genuine article by a VK station. Yes, this one has been pirated extensively on CW and it is believed that up to January 24th there had been no CW activity. Rumour also has it that the operators have not been able to be very active because of their heavy work load. (It is supposed to be a scientific expedition!)

Do you get confused with these USA calls that start with AE, AG, AH, KB, or GUAM stations that either sign KG6 or KH27? You do? Well join the club. Seriously, if anyone has a complete list of prefixes and the countries they represent could it be forwarded to me and we will get it printed in the column. Thanks

5 BAND WAZ

Those chasing the new five band WAZ should note that UA0YT is very active on 10 and 15 CW worked on 15 at 1200Z and is happy to move up to SSB on request. Vlad uses 75 watts to a Ground Plane.

LACCADIVES

If you were looking for the Laccadives (VU4ABC) in January, this DXpedition did not take place due to problems in getting authorization to operate from the islands. Rumour has it that these problems may be overcome in February or March. Watch—CW 7010, 14050, 21050, 28050 kHz; SSB 7090, 14250, 21250, 28600 kHz.

NOTES FROM THE WEST COAST DX BULLETIN

DCBS should be active from SAO THOME from approximately March 1. HB9TL will be active from the Maldives for one week-end only, either 2/4, 10/11 or 17/18. CW on 14020, 21020, 16020 and SSB on 14195, 21295, 28595 kHz.

This writer does not believe that a list of exotic call signs worked is of much value to the reader unless it contains information that details the operating habits of a particular station. To compile such a list will involve the co-operation of readers. If you feel that it is of value to you please let me know. For example under the heading of 160 metres 3G1GW, 25, 1930, 2 would indicate that 3G1GW was worked on 1825 at 1930Z from N.S.W.

Well that's it for this month, remember comments good, bad or indifferent are welcomed. This is your column, if you want it to be.

QTHs YOU MAY HAVE MISSED

V56FI — Box 541, Hong Kong.
VRIAE — Box 239, Tarawa.
VRIAY — Box 431, Tarawa.
W7JRL/SU — Via the WZ Bureau.
TA1ZZ — Via KABC.
SU1ZZ — Via YU1OFY.
SU1ER — Via YU1OFY.
WDSAJE/SU — Via N5RM.
KTCA/HCI — Paris 1107 Quito.

STOP PRESS

801GF operative hopefully 10th February to 15th March CW 14025 14051 SSB 14205 14282 kHz. VY1AA Aves Island 7th to 14th April usual DX frequencies.

MAGAZINE INDEX

Syd Clark, VK3ASC

HAM RADIO September 1978

Efficient Broadband Balun; 20 Metre Delta Loop Array; T-Network Impedance Matching to Coaxial Feedlines; 75-Ohm CATV Cable for Amateur Installations; Matching 75-Ohm CATV Hardline to 50 Ohm Systems; RTTY Modulator-Demodulator; Integrated Circuit Arrays; Tracking Down Repeater Jammers; High Performance RF-AGC Amplifier; Modified Quad Antenna; Phased Locked Loop FM Demodulator; Calibrating Meter Amplifiers; Digital Keyboard Entry System.

QST November 1978

A Baseband Communications System, Pt. 1; Frequency Measuring Tests Using a Product Detector SSB Receiver; The Two-Tone Tester; Shoes, Size 220 A, B or C; A Logic Circuit for Phasing the Telefax; Calculating Component Values; The Aerial Performers of the Radio Circuits; QRM and QRN; You've Heard It; Now You Can See It; UTC: The Right Time; Results: Field Day 1978; June VHF QSO Party; Rules ARRL 10m Contest and 160m Contest.

RADIO COMMUNICATION November 1978

The Microwave Associates Gunplexer 10 GHz Transceiver Front-End; Microwave Modules 1.295 MHz Converter; Radio Communications and The ITU; Sporadic-E Observations in 1978.

73 September 1978

Four-Wheel Fronty; T-R Exotica; The Autodialler Revisited; Watergate Special; Be Legal: Another IRL 22S Scheme; Improving the SWTOW UDI; Graduate to a Better Operating Desk; The SWL Bible; The Mobile Dream Machine; Be a Surplus Survivor; Tracking the Wild Turkey; High Q Antennas; When in Doubt, Improvise; Relief for the Rockbound; Power Supply Magic; DVM Scrapbook; Meet Mr. Blizzard; The Blizzard of '78; How Do You Use ICs; Relax and Unwind; Nuclear Attack; Computerized QSO Records; RAM Checkouts a Snap; The Case of the Missing Offset; What Do You Do with a Cube Timecube; Gourmet Guide to Capacitors; The ARC Tuner; Home-Brew Circuit Boards; 73 Reveals Facts; CB to 10; Kerchunk... Kaboom; Be Mr. Clean; Build the Triple Thrust Keyer; The Ten Metre AM Antenna Special; Buddy, Ya Got a Match; Another Trick for the 22S; Stop Timeouts Revisited; Maintain Control; CB to 10; Active Voltage Divider; Charge; Light Right; Micoder Magic; Build the IC Experimenter; A New Type 10 GHz Receiver; Two Metres at the Summit.

QSP

SSTV

John VK2XY (ex YFX and NAR) has been talking regularly to Tom Christian VR6TC on Pitcairn Island. Tom is now very interested in SSTV and hopes to be on air in that mode in the near future. He makes regular visits to the Novice sub-band on 15 metres.



MML 144/100 Watt Linear Power Amplifier

- * 80 watts minimum RMS output 100 watts RMS typical.
- * Fully protected against poor load VSWR, overheating and excessive or reverse supply rails.
- * Equipped with RF VOX and manual override.
- * Frequency bandwidth 144 — 148 MHz at — 0.5 dB.
- * 10 watts nominal for 80 watts output.

PRICE AMATEUR NETT: \$265.00

100 Watt 432MHz Linear Power Amplifier

- * 100 watts minimum output 10 dB minimum gain.
- * Fully protected against poor load VSWR, overheating and excessive or reverse rail.

- * Equipped with RF VOX and manual override.
- * Frequency Bandwidth 435 MHz — 15 MHz @ — 1dB.
- * 10 watts nominal input for 100 watts output.

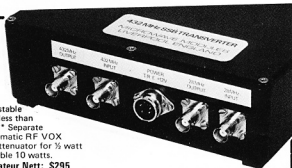
PRICE
AMATEUR NETT:
\$395.00

Transverter Model MMT 432/144'S'

UTILIZING an IF of 144MHz * 10 WATTS DRIVE of 1/2WATT * VOX OPERATED, TWO SELECTABLE RANGES 432 - 434/434 - 436 MHz. FEATURES EXTENDED COVERAGE FOR OSCAR 8

FEATURES: High quality double-sided glass fibre printed board * Highly stable zener controlled oscillator stages * PIN diode aerial changeover relay with less than 0.2 dB through loss * extremely low noise receiver converter, typical 3 dB * Separate receive converter output gives independent receiver facility * Built-in Automatic RF VOX with override facility * Built-in 10 watt 144 MHz termination, selectable attenuator for 1/2 watt * Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output.

MODEL MMT 432/144 'S' Price Amateur Nett: \$295



Transverter Model MMT 432/28'S'

FEATURES EXTENDED COVERAGE FOR OSCAR 8

Second Crystal Oscillator gives two ranges: Low 432 — 434 MHz — High 434 — 436 MHz programming available to either Transmit/receive both Low, both High, or a mixture of the two. Adjustable Drive Level is now provided by an input potentiometer. Optional RF VOX. Power Output 10 watts minimum * 28 MHz IF * Drive 1 mW to 500 mW * Aerial Changeover by PIN diode switch * Modern Microstrip Techniques * Power requirements 12 volt nominal at 150 mA 2.5 amp peak * Case size 187 x 120 x 53 mm * Spare 432 input socket.

MODEL MMT 432/28 'S' Price Amateur Nett: \$245 MODEL MMT 144/28 Price Amateur Nett: \$185

NEW READY-TO-OPERATE MODULES AVAILABLE IN THE SALES PROGRAM OF VHF COMMUNICATIONS.

All modules are enclosed in black cast-aluminium cases of 13cm by 6cm by 13cm and are fitted with BNC connectors. Input and output impedance is 50 ohms. Completely professional technology, manufacture, and alignment. Extremely suitable for operation via satellite or for normal VHF/UHF communications.

10 METRE MOSFET CONVERTER: Input frequency range 28 - 30 MHz * IF output frequency 144 — 146 MHz * Overall gain 15 dB min * Overall noise fig. 1.8 dB * DC Power requirements 11 — 13.8V at 50 mA. PRICE AMATEUR NETT: \$45.00

6 METRE MOSFET CONVERTER: Featuring 24 MHz local oscillator output for transverter use. Input frequency 52-54 MHz. I.F. Output frequency 20-30 MHz. Typical gain 30 dB. Noise figure 2.5 dB. Typical image rejection 65 dB. Crystal Oscillator frequency 24 MHz. Power requirements 12 volt ± 25% at 35 mA. MODEL MMC52/28LO PRICE AMATEUR NETT: \$49.00

2 METER MOSFET CONVERTER: Noise figure typ. 2.8 dB. Overall gain typ. 30 dB. IF: 28-30 MHz. 9-15 V 20 mA. PRICE AMATEUR NETT: \$45.00

DUAL RANGE 432 — 434 MHz & 434 — 436 MHz Converter, Type MMC 432/28 'S' & MMC 432/144 'S' Input frequency ranges 432-434 MHz (low), 434-436 MHz (high), I.F. output frequency 28-30 MHz or 144/146 MHz. Typical gain 30 dB. Noise figure 3 dB maximum. D.C. Power requirements 11-13.8 volts, 12.5V nominal. Current consumption 50 mA maximum. PRICE AMATEUR NETT: \$67.00

1296 MHz CONVERTER: Microstrip, Schottky diode mixer. IF: 28-30 MHz or 144-146 MHz. Noise figure: typ. 8.5 dB. Overall gain 25dB. Power requirements: 12 volts DC ± 25% at 50 mA. PRICE AMATEUR NETT: \$65.00

VARACTOR TRIPLER 432/1296. Max. input at 432 MHz, 24 W (FM,CW) — 12 W (AM) Max. output at 1296 MHz, 14 W. PRICE AMATEUR NETT: \$74.00

500 MHz COUNTER Model MMD050/500 PRICE AMATEUR NETT: \$175.00

BNC CONNECTORS — Excellent quality, fully imported from U.K. U.S. Mil. No. UG88E/U. PRICE AMATEUR NETT: \$1.35 each.

CONVERTERS
PACK & POST
\$2.00

AMATEUR ELECTRONIC IMPORTS IS THE EXCLUSIVE AUSTRALIAN DISTRIBUTORS FOR
THESE PRECISION BRITISH MADE UNITS FROM MICROWAVE MODULES LTD.

All prices subject to change without notice. Onwards forwarding please add sufficient for freight or postage. Excess will be refunded.

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SOME NEW YEAR SPECIALS FROM BAIL ELECTRONIC SERVICES

Please note that some items are in limited quantity, so—don't delay, they won't last forever!

FT-101E AC-DC HF Transceiver	\$795
FT-101E AC HF Transceiver	\$745
101E DC-DC Conv. Kit	\$60

N.B.: Our 101E Transceivers still include the superb "B" Model adjustable Noise Blanker PB 1292, exclusive to us! The N.B. that really does work. And for those with the PB 1582 N.B. we can supply the 1292 at \$42, plus postage \$1.50.

FT-101 W/S Maintenance Manuals	\$27 plus P.P.	\$2.00
FT-7 HF Transceiver	\$389 (Yes, fair dinkum!)	\$339
FT-227R 2m FM Digital		\$579
FL-2100B linear		\$125
YC-7B Dig. adaptor for FT-7B		\$349
FRG-7 Receiver		\$10
Battery holder for FRG-7		\$20
LFC-2A Selective SSB filter for FRG-7		\$499
YC-500S Counter 500 MHz		\$656
YC-500E Counter 500 MHz		\$112
YP-150 Dummy load/power meter		\$49
SP-101B Ext. speaker for 101E		\$59
CW filters for FT-101		\$45
FT-301 series CW, AM, RF Proc. filters	each	\$645
FRG-7000 Dig. Receiver		\$35
QTR-24 World Clock		\$19
YH-55 Yaesu Headphones, 8 ohm		
YD-844 and YD-148 dual impedance desk mics., 600 ohm/50K ohms		\$49
YO-301 Monitorscope, three only		\$299
RS Series Yaesu HF Gutter mount mobile Antennas—RSM2 base, Inc. RSE2A stub mast, with Co-ax. cable attached		\$29.90
Other Yaesu valves also available.		
Resonators—RSL-3 \$22, RSL-7 \$21, RSL-14 \$20, RSL-21 \$19, RSL-28 \$19, RSL-145 (5/8 2m) \$24.		
6JS6C P.A. Valve FT-101		\$11
Other Yaesu valves also available.		
SRC-146A Standard (Japan) 2m hand-held 5 chan. 2W FM transceiver, built-in mic., sprk., "S" meter, inc. carrying base and crystals, to clear		\$199

70 T.V. Transverter 430 MHz (two only)	\$299
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Base adaptor	\$23
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Also available Rubber ant., optional hand mic., mobile adaptor, Nicad batteries.

ROTATORS:

103 LBX \$165, 502 CXX \$255, 1103 MXX \$410, 201 AXX \$179, 1102 MXX \$379.	
--	--

MAST CLAMPS:

For 103 \$18, 502 \$29.50, 1102 and 1103 \$45.

L.P. FILTERS:

LP-7 \$6.50, TV-42 \$15, TV-476 \$10, FF-501DX \$39.

ANTENNAS:

TH6DX \$295, TH3JR \$195, Hy-Quad \$237, VS-33 \$259, DX-33 \$235, DX-32 \$145, DX-34 \$265, VS-22 \$179, VS-20CL \$165, VS-11CM \$89, VS-41/80KR \$119, VS-RG \$29, 18V \$40, TD-1 \$68. (Note: The Hidaka "VS" beams inc. balun.)

Hy-Gain BN-86 balun	\$28
Lightning Arrestors	\$4.95

ANT. COUPLERS:

HC-75 \$65, HC-250 \$89, HC-500A \$119, HC-2500 \$199. Yaesu Couplers also stocked.

SWR METERS:

RS-101 \$7.50, SWR-40 \$15, SWR-200 dual \$75, FSJ-5 dual \$29.

MORSE KEYS:

HK-708 \$14.99, HK-706 \$25, HK-808 \$85, Morse osc. EKM-LA \$13.90. Practice set TC-701 \$19.50.

The above list is not complete. There are many more items available. Contact us for your requirements.

Above prices (R.R.) inc. S.T. Freight is extra. Prices and specs. subject to change. 90 day warranty on sets, excluding power valves and power transistors. Full service facilities and comprehensive range of spares.

All items new, ex stock except FT-7 and FT-227, which are due into store approx. mid-February.



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Model HK-808. Heavy duty commercial hand key with full ball race pivots, heavy marble base and dust cover. The ultimate hand key. Price **\$85.00**

Model HK-710. Heavy Duty De Luxe Hand Key, fully adjustable, ball bearing shaft, plastic protective cover. Mounted on heavy non-skid poly marble base. Base dimensions 168mm x 103mm. Price **\$45.00**

Model HK-707. Economy hand key in all black ABS resin, metal parts protected by moulded ABS resin cover. **\$19.50**

Model HK-708. Similar to HK-707 but without cover and with smart chromium plated keying mechanism and flat American style knob. Price **\$14.99**

Prices incl. ST/Freight and Ins. extra/Prices and specifications subject to change.

Model TC-701. Morse practice oscillator with built in key and speaker. Including battery and earphone. Copy of morse code on case. Two can be wired together to form a practice communication set. Price **\$19.50**

Model MK-701. Manipulator (side swiper) for an electronic keyer. Accurate and restful keying operation are assured owing to a heavy metal plate and a frictional rubber belt beneath the periphery of the main base. **\$39.00**

Model BK-100. Semi-automatic (bug) key, with standard adjustments, wide speed range, protective plastic cover, on heavy non-skid base, beautifully finished. Base dimensions 175mm x 75 mm. Price **\$49.00**



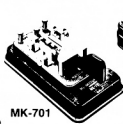
HK-707



HK-708



TC-701



MK-701



BK-100

a decade of research in HF transceivers brings you the FT-101Z series ... at \$799 basic price it's a steal!!

Today's technology, backed by a proud tradition, is yours to enjoy in the all-new FT-101Z (and FT-101ZD) high-performance HF transceiver from YAESU and BAIL. A host of new features are teamed with the FT-101 heritage to bring top dollar value.



Photo shows FT-101ZD transceiver with Digital display. FT-101Z Analog Model (without digital display) available at \$799 and you add the optional extras if desired. (Accepts 901 series acc. e.g. multiscopes, transverter, ant. cpl., etc.)

Rcvr includes variable IF bandwidth with two 8-pole crystal filters and a highly effective all-new NB circuit with front panel blanking level control. Also included are 10 and 20 dB attenuators, and offset tuning for transmit and receive.

Trans. section uses two 6146 final tubes with RF neg. feedback. An RF speech processor is built in. Available options include DC-DC converter, cooling fan, dig. display/counter unit (for FT-101Z), hand or desk mic., and CW filter. CW filter may be used in addition to SSB filter in CW mode. Write for our full colour brochure today.

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JAS7579-38

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Only three months ago in our December 1978 advertisement we gave a bouquet which has all too quickly wilted and faded KENWOOD AUSTRALIA has meanwhile raised their prices to the level of or above the equivalent retail prices in JAPAN at the present 1 February 1979 YEN-Dollar exchange rate. Replacement cost of our stock of TS-520-S and TS-820-S transceivers is now higher than we still have been selling them for! Talking about bargains?

Further, AUDIO-TELEX, the local branch of TELEX INC. U.S.A. who last year took over HY-GAIN ELECTRONICS CORP. is now offering Hy-Gain antennas to dealers at higher prices than we are selling them for. Again, talking about bargains? We have no secrets and don't sell at a loss but of course this cannot last. We are actually gambling on an improvement of the YEN-Dollar exchange rate for future KENWOOD supplies.

HY-GAIN ANTENNAS:

18-AVT/WB 10-80M vertical 23' tall	\$125
TH6-DXX 10-15-20M senior 6 el. Yagi 24' boom	\$300
TH3-MK3 10-15-20M senior 3 el. Yagi 14' boom	\$240
TH3-JR 10-15-20M junior 3 el. Yagi 12' boom	\$175
204-BA 20M 4 el. Tiger Array 26' boom	\$230
HY-QUAD 10-15-20M full size Cubical Quad	\$260
2M 5 el Yagi with balun 6'3" boom	\$25
2M 8 el Yagi with balun 12'6" boom	\$30
2M 14 el Yagi with balun 15'6" boom	\$40
BN-86 Balun for HY-GAIN beam buyers only	\$20
BU-5 Balun suitable for 10M beams	\$14

ANTENNAS SUITABLE FOR 10M:

11M 5 el. Yagi 17' boom	\$70
11M GLP with 3 radials	\$20
CLR-2 11M 1/2 wave vertical w/3 radials 19'10"	\$40
CLR 11M 1/2 wave vertical w/4 radials 22'9 1/2"	\$50

ACCESSORIES & COAX CONNECTORS:

SWR-50A Twin meter 3.5-150MHz 1KW	
SWR/Pwr meter	\$26
Bumper Mount with 3/4" 24 thread antenna mount	\$7
Gutter Mount with 3/4" 24 thread antenna mount	\$4.50
5M length RG-58U with PL-259 one end	\$3
M-ring body mount	\$3
GLP Right angle RG-58U to SO-239 w/lock nut & weatherproof cap	\$3.50
MLS Right angle RG-58U to PL-259	90c
PL-259 standard & solderless, RG-8U & RG-58U	75c
In-line splice RG-8U & RG-58U	75c
SO-239 chassis connector 2 & 4 hole mounting	75c
Right angles & T-connectors	\$1.50
Double female connectors	80c
Mic. sockets, chassis & in-line, 3 & 4 pin	85c
3 circuit microphone jacks	85c
Crystals for QUARTZ-16 2M transceiver:	
Channel 51 T/R 146.55 — pair	\$5
Channel 64 T/R 147.20 — pair	\$5

ROTATORS & CABLES:

KEN KR-400 rotator with 28V AC control box	\$125
CDR HAM III rotator with 28V AC control box	\$175
No. 14 hard drawn copper wire — per meter	10c
3/4" H.D. foam coax extra low loss — per foot	\$1
Type RG-8U foam coax cable — per yard	80c
Type RG-58U coax cable — per yard	30c
8 core rotator cable — per yard	65c

KENWOOD PRODUCTS:

TS-520S 10-160M SSB/CW transceiver 240V AC	\$700
TS-820S 10-160M SSB/CW w/Digital readout	\$1100
TL-922 10-160M Linear Amplifier	\$1200
TS-700SP 2M all-mode transceiver	\$850
TR-7400A 2M transceiver	\$500
TR-7500 2M transceiver	\$350
DG-5 Digital display for TS-520S	\$250
TV-506 6M transverter	\$250
TV-502 2M transverter	\$300
AT-200 Antenna matchbox	\$175
DS-1A DC-DC converter	\$75
DK-520 adaptor for DG-5 to TS-520 use	\$20
LF-30A low pass anti-TVI filter	\$30
VFO-820 external VFO for TS-820S	\$185
VFO-520S external VFO for TS-520S	\$160
SP-820 external speaker for TS-820S	\$60
SP-520 external speaker for TS-520S	\$30
YG-88C CW filter for TS-820S	\$55
YG-3395C CW filter for TS-520S	\$55
MC-10 hand held microphone	\$20
MC-50 desk microphone	\$45
HC-2 Ham clock	\$35
BS-5 (TS-520S) & BS-8 (TS-820S) pan adaptors for SM-220	\$65
TS-120V 12V DC mobile transceiver with NB, VOX, IF Shift & digital readout, 30W PEP	\$600

NOVICE SPECIALS: Still available at these low prices

Transceivers for 10M coverage, AM/USB, 15W PEP:

- (a) **SIDE BAND SE-502** 240V AC/12V DC w/inbuilt SWR/RF meter 28.3-28.6 MHz \$150
- (b) **UNIVERSE 224M** 12V DC 24 ch. 28.480-28.595 in 5 KHz steps Clarifier operates on both transmit & receive \$125

Set of Crystals for Amateur license holders for converting 23 ch. 27MHz CB units to 28MHz, suitable **SIDE BAND**, **UNIVERSE**, **KRACO**, **HY-GAIN** etc. **SSB/AM** units:

Sets of 8 crystals converts to 28.480-28.595MHz .. \$40

SUNDRIES:

FRG-7 .5-30MHz General coverage receiver	\$350
IT-7 10-80M 12V DC transceiver	\$475
ICOM IC-202 2M SSB portable transceiver	\$175

All prices quoted are net, ex Springwood NSW, cash with order, subject to change without prior notice. All risk insurance is free: freight by air, road, rail or post at cost. All orders cleared on a 24 hour basis after receipt with payment.

Arie Bles (VK2AVA) Proprietor

Roy Lopez (VK2BRL) Manager

Ron Henderson VK1RH
Federal WICEN Co-ordinator,
53 Hannaford St., Page ACT 2614
Ph. (062) 54 2059. A.H.

INTERNATIONAL NEWS

message form with a text to guide the reader in its compilation. In a later issue I will describe how to send the formal message by radio.

The pre-printed message form is not essential, but it is a very valuable guide to make sure you do not forget some important piece of information. ■

What is the standing of amateur radio internationally? Here is the text of an address by Mr. M. Mill, the Secretary-General of the ITU to the IARU's Region 26th triennial conference held in Panama 8th September, 1978. The report is reprinted from IARU Region 2 News of November 1978.

"May I begin by offering, on behalf of the International Telecommunication Union, my warmest congratulations and sincerest wishes for a prosperous future to the International Amateur Radio Union which is celebrating its fifty-third anniversary this year.

You can now look back on more than fifty years of intense activity which, through disinterested research and sound scientific studies embracing the entire radio frequency spectrum, has made an appreciable contribution to the progress of radio communication.

This half-century of international co-operation has forged a chain of human brotherhood between all those who, by inclination or through dedication, have devoted or are devoting the greater part of their leisure time to seeking human contact over continents and seas, and beyond differences of language, nationality, religion and political systems.

The millions of chance contacts which have occurred during this period have been instrumental in saving many lives, thus making the International Amateur Radio Union one of the most useful and dynamic organizations when it comes to helping to save individual lives or the lives of many in natural disasters and catastrophes.

You will, therefore, readily understand, Mr. Chairman, how much I, as Secretary-General of the ITU, appreciate the pleasure and honour of taking part with you today in this closing meeting of your triennial Conference.

It is hardly necessary to remind you that the amateur service is one of the oldest radio services, for there have been radio amateurs since the very beginnings of radio. In 1925, amateur radio was organized as a service in connection with the first regular sound programme broadcasts, at a time when the use of radio links for the Maritime Mobile Service was already widespread.

Thus considering the very special place which the amateur service enjoys in the general body of radio services recognized by the ITU, the pleasure I feel at being among you is perfectly understandable.

Your amateur service is defined in the Radio Regulations as "a service of self-training, intercommunication and technical investigations carried on by amateurs, that is, by duly authorized persons interested in radio techniques solely with a personal aim and without pecuniary interest".

This service is, hence, recognized as having two lofty missions:

First, to instruct, that is to say to take part in the training of those who, in any capacity, bear responsibility for the operation of radio services.

Second, to engage in disinterested research, in order to deepen our knowledge of such matters as the mechanisms of wave propagation.

It is therefore with the greatest satisfaction that we acknowledge the fact—and a most important fact—that radio amateurs have followed very closely the various developments brought about by the use of every higher frequency or by new techniques, such as space communications. Several thousand amateur radio enthusiasts have already made use of satellites (in particular, OSCAR 6 and OSCAR 7) and their observations will undoubtedly help to enhance our knowledge of the phenomena involved.

I will mention briefly, since it is well known (I would even say it is perhaps the aspect best known

introduced Mar 77
Formerly
CM009, F Sigs 50-1, A224

MESSAGE FORM

Note: Shaded areas are for Component/Signs use only.

LINE 1 _____ LINE 2 _____ LINE 3 _____ LINE 4 _____ LINE 5 _____		SECURITY CLASSIFICATION AND SPECIAL HANDLING INSTRUCTIONS UNCLASSIFIED											
PRECEDENCE - ACTION ROUTINE		PRECEDENCE - INFO ROUTINE											
DATE - TIME GROUP 050130ZDEC78		MESSAGE INSTRUCTIONS											
ROUTING INDICATORS													
FROM <u>WICEN FEDERAL CO-ORDINATOR</u> TO <u>ALL INTERESTED AGENCIES</u> <u>INFO FEDERAL EXECUTIVE</u>		SIG/ORG NO WICEN 3 GR _____											
HOW TO WRITE A MESSAGE.													
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2. DATE TIME GROUP IS DATE IN TWO DIGITS PLUS Z TIME (GMT) WITH MONTH AND YEAR OPTIONAL.													
3. SECURITY CLASSIFICATIONS CAN BE TOP SECRET, SECRET, CONFIDENTIAL, RESTRICTED, UNCLASSIFIED. PROBABLY ONLY THE LAST TWO WILL BE SEEN BY WICEN.													
4. ORIG NO IS THE ORIGINATOR'S UNIQUE NUMBER, OFTEN ALPHA NUMERIC, EG WICEN 3 ABOVE.													
5. FROM IS THE ORIGINATOR'S NAME.													
6. TO IS ADDRESSEE(S) NAME(S).													
7. INFO CAN BE USED BEFORE INFORMATION, NOT ACTION, ADDRESSEES.													
8. TEXT IS USUALLY WRITTEN OR PRINTED TELEGRAM STYLE IN PARAGRAPHS.													
9. ORIGINATORS SHOULD SIGN MESSAGE TO AUTHORIZE RELEASE. THE SIGNATURE IS NOT TRANSMITTED.													
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FOR CTS USE	DATE	TIME	SYSTEM	OPERATOR	DATE	TIME	SYSTEM	OPERATOR	SECURITY CLASSIFICATION UNCLASSIFIED				

to the general public), the part played by radio amateurs in emergency communications, especially in the event of natural disasters or catastrophes; the use of high frequencies in this sphere is so much a matter of common knowledge that there is no need to dwell upon it.

But the role of amateurs in technical training seems to be little known for all its great importance. As you may be aware, the ITU is engaged in a vast programme of technical co-operation to aid developing countries to expand their telecommunications. In this programme training plays a predominant role. There is no doubt that the development of amateur radio networks in the countries concerned makes a substantial contribution to the execution of this immense task and a contribution, moreover, that costs governments so little.

All this certainly explains the importance of the amateur service in the life of our Union, which, as I imagine you all know, has its own amateur radio station in the headquarters building, the call sign of which is 4J1UTU.

In this connection, I am happy again to express my warmest thanks to the IARU for the very up-to-date equipment and beautiful furniture they have offered to the International Amateur Radio Club. This equipment and furniture, added to what our club already had, have raised the Union headquarters amateur station to the standard that befits it.

As in the case of TELECOM 75, radio amateurs will be given an opportunity of taking an active part in the third World Telecommunication Exhibition, TELECOM 79, to be held in Geneva from 20 to 26 September, 1979. So you are all invited to participate in one way or another in this great event and I earnestly hope to be able to welcome the largest possible number of delegations of radio amateurs from all over the world. During TELECOM 79, the 22nd of September will be specially set aside for a world-wide gathering of amateur radio fans.

I would not like to conclude this brief list of the activities carried out at ITU Headquarters in connection with amateur radio without mentioning that many ITU staff members and a large number of delegates to our conferences are radio amateurs too.

I have noted with pleasure, when looking through the technical reviews, of amateur radio societies, that they have already embarked upon active preparation for the World Administrative Radio Conference to be held in 1979. We cannot, in my view, begin too early to give serious thought to the problems concerning the amateur service, and indeed all the other radio services, which will be raised at that conference.

This administrative conference will be a particularly important one, since it will be the first since 1959 to deal with the radio frequency spectrum as a whole. All the administrative radio conferences since that date have had a limited agenda relating specifically either to space radio-communications, the Aeronautical Mobile Service, the Maritime Mobile Service or broadcasting.

You will readily understand that it is impossible for me to make the slightest forecast as to the way this conference will go. One thing is pretty sure, however, namely, that the problems it has to face will be highly complex. It would therefore not be amiss for me to emphasize the care you should take to present to your national administrations any wishes or requirements you have to formulate in the most convincing manner possible. Nobody can tell what will come of it; the very most I can say is that more often than not when people describe radio regulations or a table of frequency allocations as "good" they mean that the degree of dissatisfaction is roughly the same for the users of all the different services. But I am convinced that the half-century that has gone by has amply demonstrated the importance of the part played by radio amateurs and that once again you will have the sympathy of the conference on your side."

It is understood that Mr. Mill will be attending the special CCIR Region 3 Seminar in Sydney early in April. ■

WHEN PURCHASING GOODS,
SAY YOU SAW THEM ADVERTISED IN AR

Join the I.W. net at 2300Z on Thursdays
on 14165 kHz when you have intruder
information. ■

LETTERS TO THE EDITOR

Any opinion expressed under this heading
is the individual opinion of the writer and
does not necessarily coincide with that of
the publisher.

14 Scott Street,
Seflon Park, S.A. 5083.
4/1/79.

The Editor,

Dear Sir,

Congratulations on the publication of your December special Novice issue, which I am sure will be more than appreciated by all past and future successful Novices. The more technical advice given in your AR the more it will assist the Novices in gaining their full AOCIP in the very near future. So we say thank you and keep up the good work. Your article on Harry Alderson VK5NSR, December issue of the AR, impressed me very much, as we both have something in common, being around the same age group. Also being a retired ex-serviceman and a wireless operator during the Second World War. My army life began by being called into the army as a volunteer signal specialist, as I was capable of Morse speed around 20-25 words a minute and could also read the sounder used by the PMG Department. We had to instruct women (AAWS) and men how to send and receive Morse code, so therefore I became a W/T instructor and operator.

Now that there seems to be more ex-servicemen wireless operators getting their Novice licences, one may wonder if it is possible for us to set up a home defence communications unit in each State. This would set up a network of communications around Australia. Most of the ex-servicemen are retired and this would give them some satisfaction in life. Something could be organised as we have the equipment and know the procedure with a little polishing up, and we would not be wasting good talent that has taken years to obtain. Ex-servicemen in each State should get together and form a club with the aid of the AR. What do you think? Is it worthwhile?

Kindest regards and congratulations on a fine AR Journal.

Yours sincerely,

H. C. Harmer VK5NHX. ■

P.O. Box 173,
Phrahan, Vic. 3181.
12/1/1979.

The Editor,

Dear Sir,

I would like to thank the Tasmanian Division, Launceston Branch, of the WIA for the kind hospilities they extended to me while I was in Launceston holidaying at Christmas time. I took my converted CB rig over to see what was doing on 10 metres, but my operating was very limited due to local area and poor antenna set up, and only made two contacts New Year's Eve, one in the morning and one in the afternoon. The latter, Ian VK7IC, invited me to the local WIA New Year's Eve barbecue, which I gladly accepted as I was on my own and looked like having a pretty quiet New Year. Ian called at the hotel for me and took me out to the bar where the barbecue was being held; he also provided me with food. He introduced me to Tony VK7GCC, who made me very welcome, and I was soon introduced around. I had a very enjoyable time. It made my day and although I

only had two contacts it certainly was worth carrying the rig over. They seem to be very active and well organized, the Launceston Branch, and I would like to take this opportunity of wishing them all the best for the New Year. If you are ever down Launceston way, look them up, they'll make you very welcome. Thanks again, Ian and Tony.
Yours sincerely,
Frank Robinson VK3NHJ. ■

13 Bowler Street,
Holbrook, N.S.W. 2644.
22/12/1978.

The Editor,

Dear Sir,

I am a regular listener to the nightly CW transmissions to further my knowledge to obtain the NOACP.

I would like to thank the people who make this possible and the effort they put into this.

However, in short, I would like to make a suggestion. Like myself, many others have sat in previous exams and have failed because of ITU Morse being used, as the nightly Morse is meant for the learner.

I would like then to suggest if at all possible that at least half the transmission put to air be in ITU Morse.

Yours faithfully,

Peter Dor. ■

12 Bailey Street,
Bairnsdale 3875.
21st January, 1979.

The Editor,

Dear Sir,

I am writing to correct certain rumours about production of the Atlas 350XL Amateur Band Transceiver. One of our so-called reputable dealers for multibrand brands of equipment has seen fit to state that the 350XL has been withdrawn from production. As an Atlas dealer I must state that this is simply not true. Earlier this month I received two 350XLs from California and by the time this goes to print they will be in their owners' hands. Atlas are, however, concentrating on production of a new, third, and cheaper model and, being a small company, have delayed production of the Atlas 350XL while building up stocks of the small new model. All three models will continue to be available in future.

Another matter deserves clearing up. There is no sole Australian distributor for Atlas. The company has appointed only dealers in Australia all with equal buying rights.

It is notable that this misleading and deceptive publicity did not appear in "Amateur Radio" magazine.

Yours sincerely,

Edwin R. Rooms, B.Comm. (Melb.) VK3NRR/Z77,
Yachtsman, Dealer for Atlas Radio. ■

9 Tallara Avenue,
Mt. Gambier, S.A. 5290.

The Editor,

Dear Sir,

Some time ago I started a collection of postage stamps specialising in electrical and electronics. This includes radio, television, computing, telephones, telegraph, cables and of course ITU stamps.

I have now arrived at the stage where my collection is becoming difficult to add to from the sources available to me in the country.

If any of your readers could help me it would be most appreciated.

Ivan Huser VK5QV. ■

Bank Lane,
Quirindi, N.S.W. 2343.

The Editor,

Dear Sir,

In view of the very crowded conditions prevailing on 80m at present, and the fact that CB is now going UHF, how about our Novices being permitted to use a portion of the 2m band, instead of going UHF with the CB crowd. Let us keep our Novices active and on the right track.

Yours kindly,

B. Emerson VK2NSE. ■

IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC

CONTESTS

Wally Watkins VK2ZNN/NCU
Box 1065, Orange 2800

March:

3/4 ARRL DX PHONE CONTEST
10/11 COMMONWEALTH CONTEST
17/18 ARRL DX CW CONTEST
24/25 CQ WW WPX SSB CONTEST
24/25 BARTG RTTY CONTEST

April:

7/8 POLISH "SP" CW CONTEST
21/28 POLISH "SP" SSB CONTEST
28/29 DUTCH "PACC" CONTEST
28/29 SWISS "H 26" CONTEST

HELVETIA 26 CONTEST

April 28-29, 1500-1700 UT.

Rules: All bands 1.8-28 MHz. CW or phone. Exchange: RS(T) + serial from 001. Swiss stations add the Canton abbreviation, e.g. 57(9) 001 ZH.

Score: Each contact with a HB station counts 3 points. Each station can be worked once per band, either on CW or phone. The multiplier is the sum of the Swiss Cantons worked on each band, making a possible of 26 per band.

Logs to: TM USKA K. BINDSCHEDLER, HB9MX, Strahleggweg 28 8400 Winterthur, Switzerland, postmarked not later than 30 days after the contest.

1979 CALL BOOK

The next issue of the WIA Amateur Call Book is now under consideration. Up to date information of the various clubs are required urgently. Kindly forward details to the Editor (Call Book), P.O. Box 2611W, Melbourne 3001, by 30th April 1979.

HAMADS

- Eight lines free to all WIA members. \$9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTH means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

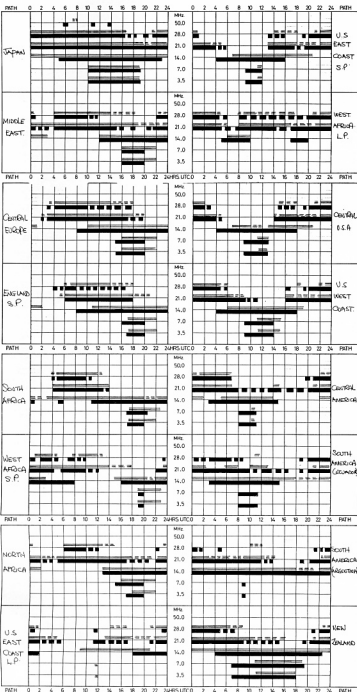
FOR SALE

Urgent Shack Cleanup. Mosley TA 33 Jnr., as new with instruction sheet, 52 ohm cable, \$150; Hallcrafters HT37 10-80m, SSB/CW, AM Tx, uses pair 6146B tubes, complete with dynamic mike and owner's manual, 100W PEP output, excellent cond., \$150; Hallcrafters FPM-300 250W PEP input, 240V AC or 12V DC, SSB, CW Tx, 10-80m Rx, all solid state — this transceiver is made in USA and is very cheap at \$450 (owner's manual included). John Berry, 40 Grosvenor St., Woolahra, NSW 2025. Ph. (02) 369 6455 Bus.

Pye FM738D. 25W, FM low-band VHF Carphones, fully solid state except Tx finals, suit commercial service or conversion to 6 FM, mics and finals missing otherwise complete, \$40 each. Jeff VK3ZJS. Ph. (03) 337 1536 A.H.

Swan 500C Single Sideband Transceiver. operates on 80, 40, 20, 15, 10m, input power 520W PEP, complete with power supply and matching external VFO, also complete set of spare tubes, as new, the lot \$450. VK4KS. Ph. (07) 353 1968.

FTT, as new, complete with Yaesu gutter grip HF whips for 40, 20, 10m, \$550. ONO: Kenwood TR2200 2m portable Tx/rx rocks for R2, R7, R8, SIM 40 charger, new nicads. \$200. ONO: Yaesu YD-844 desk mike, \$30. VK2BJP, QTHR. Ph. (060) 21 1929 Bus., (060) 25 4580 A.H.



LEGEND

FROM WESTERN AUSTRALIA
FROM EASTERN AUSTRALIA

BETTER THAN 50% OF THE MONTH, BUT NOT EVERYDAY

LESS THAN 50% OF THE MONTH

PREDICTIONS COURTESY I.P.S. SIOKEY

ALL TIMES UNIVERSAL UTC (GMT).

Icom IC201 2m Tcwr, originally designed to operate 145-148 MHz but modified to cover 144-145 and 146-147 MHz, has 600 kHz offset for repeaters and operates on FM/SSB/CW, \$300; Astro 200 digitally tuned 80-10m tcvr, fully solid state with power output approx. 100W, impeccable, in original carton, \$700; KP202 2m FM Tcwr in pieces with RX working, xtls for 6 channels, \$70. Ph. Michael (06) 82 4941 Bu.

432 MHz 10W SSB Transceiver, Belcom 430, as new, \$225. VK1PV, QTHR. Ph. (068) 49 5882 A.H.

FT 9010 DM Transceiver, 6 months old, original packing, English handbook, wired 240V AC, v.g. \$1300. ONO. Brindley VK3YFJ. Ph. (03) 870 0540 A.H., or (03) 560 5233 Bu.

Dentron Linear MIA2500, \$875; Daiwa processor RF550, \$110. Both slight use only, as brand new. J. Moyle VK4ZT, QTHR. Ph. (079) 73 6580.

Yaesu SB FR100B, ham bands 3.5 to 29.5 MHz, \$200; SSB TX FL100B, \$150; with manuals in English. Note: This equipment uses valves. VK1ML, QTHR.

Trio TS500 80-10m Transceiver, S/S PSU 2 x 6146 finals, in good condition, \$375; Kenwood TV202, 10m transceiver, TS500 or 820, as new, \$200. ONO; AWA MR208 on 52.525 MHz FM, goes well, with remote control unit, \$45. VK3NG. Ph. (054) 82 2023 A.H.

Yaesu DC 200, power supply for FT200, complete with cable, manual, purchased new and few hours use, \$100. VK3BW. Ph. (052) 69 2322.

Kraco 30 ch. FR100B, fully converted to 10m, slider, etc., \$100; Hygain 18 AVT/VNB 80-10m trap vertical, few months old, \$160. Mike VK2NWO. Ph. (02) 371 8063.

FT75B Transceiver, complete with mic. and manual, good condition, little used, 30W PEP-10W PEP, 240V AC, 3.5, 7, 14, 21, 28 MHz, crystals for Novice bands, cost \$450, sell \$300. VK4NHW, QTHR. Ph. (07) 558 4296.

Icom 202E SSB Trx, as new, complete in packing, used 3 times, now have TS700, extra xtal price \$160. Peter VK2DAB. Ph. (02) 069-62 5001 Bu. (02) 62 5163 A.H.

Kenwood TS-820S, Inc. DC-DC converter, service manual, \$950; AT200 aerial tuner, \$150; SP820 external speaker, \$50; Hidaka VS-33 tri-band Yagi, 3 el., 14 ft. boom, \$240, inc. boom; Shure 44A 50 ohm mic, \$50; Shure 401A 50 ohm mic, \$25; Palomar engineers' R noise blinder, 1-100 MHz, \$70; Hustler MO-2 mast, BM-1 bumper mount, 85m, 15m, 10m, resonators, lot \$95; Yaesu TVI filter PF-50 DX, \$25; Kenwood TVI filter LF-30A, \$25; all in excellent cond. VK5PMF, 8 Macintosh St., Mt. Gambier, Ph. (087) 25 2407.

Shack Clearance, going overseas, lots of items, VK2ZGF, QTHR. Ph. (02) 487 1353 week-ends.

Drake C-line T-4XC 160-10m, xtals fitted, spare tubes, Drake AC4 power supply, Shure 44A desk mic., R-4C Rx 160-10m xtals fitted, plus 10 extra, 3 CW filters, noise blinder, MS-4 speaker, WA RF watt meter, Swan 1000-X linear 4X 8950 grounded, all first class cond., all manuals, \$2000 complete; Drake TR3 Tcwr, Drake power supply, mic. and manual, \$350; GDO Delica transceiver WB-200, cost \$119, sell \$75, used 4 times; Realistic DX-150B solid state comm. Rx with speaker, \$100; Matsunaga voltage slide regulator, G-280V, 50-60V, 4.2A, first class, \$50. Must sell, offers considered, Alick VK2EF, QTHR. Ph. (02) 918 3560.

FT301D Transceiver with microphone and 5A power supply, operating perfectly in 20W mode, 100W linear needs servicing, \$600. VK2PV, QTHR. Ph. (02) 371 7681.

Crystals for Ken KP202 Transceiver, forward repeaters 2 to 8 and reverse 8, 50 per pair to 40 the lot. VK5KT, QTHR. Ph. (08) 79 4262 A.H.

Johnson Viking CB Transceiver, motor to 10m, Immac. cond., coverage 28.500 to 28.620, 20 PEP, \$150, ONO; also linear amplifier, 80-10m, solid state, with 12 dB pre-amp 250W PEP output, excellent cond., \$150, ONO. Ph. (03) 743 6708.

TEN-TEC Century 21, Model 570, CW Transceiver, in perfect condition, features 70W input all bands 3.5 to 28 MHz with full CW break-in, \$350. VK3XU, QTHR. Ph. (03) 725 0624.

Kenwood TR7400A, with Hustler 5/8 whip and trunk lid mount, with operator's and maintenance manuals, less than one year old, in excellent cond., \$370. John Proctor, Ph. (02) 624 6075.

Comm. Rx RAAAF ARI, AM, SSB, NBFM, CW, 22 tubes, var. AGC, NB, 1.4-29.3 MHz cover, 240V, \$55; Novice 80m TX 10W DC AM, good audio, 2 xtals, 1 x CW, 1 x Ph., 240V AC, \$50; 40-80m Rx board, just add PSU and audio for complete unit, 455 KHz IF, \$20; 2m PA, diecast box, 10W up to 45W, 12V DC, uses 2N6064 trans., \$45. VK2QF, N. Mattick, Harpgraves, NSW 2850.

Tyvo Sevo Deluxe, Model 12-T2241-1, 12V DC, 240V AC, 12 in. screen, 300 ohm and 75 ohm ant., 1/P and whip, never used, as new, provision for VHF tuner, must sell, \$80; 5 el. 2m Yagi, brand new, 5y/2m, J beam, assembled with balun, \$35 (343H present retail price). B. R. Kendall VK3ZDM, QTHR. Ph. (04) 41 236 A.H.

419 in. 10" TV Camera Chain complete, working, spares, \$400; ONO; also garage sale of surplus amateur equipment, mainly ATV. Barry Gerdes VK2ZAH. Ph. (02) 47 4421.

OBITUARY

Mr. ERIC E. CORNELIUS VK3EC

It is with deep regret that we record the passing of another OT—Eric Cornelius.

Eric passed away peacefully at home on the 7th of January and his storehouse of knowledge and advice will be sadly missed.

Eric obtained his AOC (No. 1625) in 1956 and was often heard pre-war from his QTH in Nedlands. As well as his deep interest in electronics, Eric was keenly interested in photography, music and high quality sound (long before the hi-fi era began) and, in the early 1940s, was busy building his own sound equipment and processing his own films—his passion for technical excellence being reflected in this work. An electric organ built in the late 1940s was a source of joy to him and his family.

Around the 1950s Eric combined his talents in sound and photography in a new-found interest—Television. With his converted cameras and technical know-how he produced a complete home grown closed circuit TV system, which was a monument to his ingenuity and amazed his many friends. This work was culminated in a series of articles that appeared in AR in 1958.

Eric has a distinguished record of over 40 years with the PMG engineering department (now Telecom) commencing in November 1938. His career encompassed broadcast studio, transmitter and telephone engineering and, at the time of his passing, he was in charge of the Trunk Service Tech. Centre—an organisation charged with the sorting out of the hard technical problems in multi-channel trunk line systems for the whole of WA.

His cheerful disposition, his willingness to help and his technical counsel will long be remembered by his workmates and amateur friends alike.

To his wife Ruth, and his daughters Jocelyn and Leslie, we extend our deepest sympathy.

Contributed by Frank Beadle VK6FW.

SILENT KEYS

It is with deep regret that we record the passing of—

Mr. R. R. ALDRIDGE VK2NZ
Mr. E. E. CORNELIUS VK3EC
Mr. W. C. BLAKELEY VK3ABD

WANTED

Wanted for AOC candidate, comm Rx, Ken KP202, Icom IC225. Enquiries to Peter Willmott. Ph. (03) 727 1802.

STV Robot 70A Monitor with E26 or similar long-persistence CRT, ham built or imported, in good working order. Details to George, PO Box 366, Surlers Paradise, Qld., or ph. (075) 30 9111.

Mobile Transceiver, HF (at least 20-80m), for use in August on expedition retracing Forrest's crossing of Kimberley 1879. Typical gear required is FT7 or Icom, Kenwood mobile, near new and reliable, all or nearly all solid state; whips and associated hardware required. L. Pearly VK2BLP (ex WW2 RAAF), QTHR. Ph. (049) 54 9488 (school hours).

2m or FM Transceiver and beam antenna, also slow and fast scan TV equipment. John VK2BYK, Box 167, Penrith 2750. Ph. (047) 21 2822.

Parts from or a partly wrecked RCA AR880 Rx. Colin Gracie, PO Cavendish 3408.

Barlow Wadley Loop XCR30 MK. 2 communication Rx in good cond. VK5NDT, L50703, Ph. (085) 64 2159.

Ken KP202, Icom 228 or 22A. G. White VK2YJO. Ph. (02) 55 1793 A.H., or (02) 50 9328.

Q-Multiplier KW110, plus instruction sheet, for use with KW200E, VK3SV, 40 Hardecicks St., Balwyn, Vic. Ph. (03) 80 2330.

Circuit Diagram and conversion info for a Plessey-Vinten MTR30A to 2m FM. Frank Brockbank VK2AFZ, 180 St. Johns Rd., Cabramatta, NSW 2156.

TRADE HAMADS

XITA "Glass Teletypewriter", needs only a keyboard and TV set to originate and display 16 lines of 64 characters; switchable for 45.45 baud/110/300 ASCL, 30 mA or TTL interface; full U/I and Greek char. in ASCII mode, addressable cursor; feed on-board PSU 9-12V AC or plug into an S-100 slot; micro computer controlled pre-programmed; full kit, \$169, including delivery and sales tax; suitable keyboard kit, \$70. From The Micro Shop, Box 297, Gawler, SA 5118.

QSL Cards, Log Books, Contest Log Sheets. Send a 20c stamp for samples and prices to Linda Luther VK4VU, PO Box 498, Nambour, Qld. 4560.

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1.



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The large weighted flywheel knob mounted with low friction ball bearings is used to drive an optical chopper to provide pulses to the synthesiser LSI, which shows a full 7 digit readout. A breaking mechanism, which operates electrically, engages to provide a smooth feel at slow speeds; and a "dial lock" button holds the reading at the time it is pushed, even though the knob continues to rotate.

The IC211 incorporates computer compatible interface via the 24 pin accessory socket on the rear panel which enables PIA connection for the microprocessor buff.

computer compatible

The IC211's synthesiser steps are displayed, with positively no time lag, backlash or uncertainty in display stability, in increments of 100 Hz or 5 KHz from 144–146 MHz, and in 5 KHz from 146–148 MHz for FM operation. Any offset from 10 KHz through 4 MHz for repeater use can be programmed.

The IC211 contains both 240vac and the 13.6vdc power supplies and has a built-in high SWR autpower control. Variable output power contributes to the IC211's versatility. Output between 500 milliwatts and 10 watts may be front panel controlled on FM.

More of the maximiser's built-in standard features include: a pulse type IF noise blanker; front panel discriminator meter, SWR meter; VOX with adjustable VOX gain delay and antivox; CW monitor volume level; and semibreak-in CW operation.

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2.



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The IC-701's single frequency control knob puts fully synthesized instant tuning at a single finger tip. WIDE bandwidth, with 100 Hz per division and 5 KHz per turn, is instantly co-ordinated between the smooth turning knob and the synthesizer's digital read-out with positively no time lag or backlash (no waiting for counter to update: less operator fatigue). And at the push of the electronic high speed tuning button, the synthesizer flies through megacycles at 10 KHz per step (500 KHz per turn).

The computer compatible IC-701 LSI chip provides input of incremental step or digit-by-digit programming data from an external source, such as the microprocessor controlled accessory which will also provide remote band selection and other functions.

Full band coverage of all six HF bands, and continuously variable bandwidth on filter widths for SSB, RTTY, and even SSTV, help to make the IC-701 the very best HF transceiver ever made. IC-701 includes two CW widths, all of this standard at no extra cost.

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